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CLINICAL ASPECTS OF PRIMARY ATYPICAL PNEUMONIA

A STUDY BASED ON 1,862 CASES SEEN AT STATION
HOSPITAL, JEFFERSON BARRACKS, MISSOURI,
FROM JUNE 1, 1942 TO AUG. 10, 1943

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The increasing incidence of primary atypical pneumonia in certain army hospitals in combination with its frequently prolonged febrile period and slow convalescence is rapidly making it one of the most important causes of man days lost from duty in the military service. The appearance of this disease in significant numbers of cases at the time the medical literature was heralding the conquest of pneumococcal pneumonia is but another indication that medicine will never become a static science.

Recent reports by a commission representing the Surgeon General (Dingle, Abernathy and others¹), Dingle and Finland,² Reimann,³ Seeds and Mazer,⁴ Campbell and his collaborators⁵ and MacLeod⁶ have thoroughly reviewed the present state of knowledge regarding causation, clinical aspects, epidemiology, x-ray appearance and treatment. It has been shown that primary atypical pneumonia, as the name suggests, is a heterogeneous group of diverse causation. Occasional cases and groups of cases have been shown to be caused by influenza A and B viruses associated with staphylococcal and streptococcal infection, psittacosis, ornithosis and related diseases, the virus of lymphocytic choriomeningitis, the Q fever of Australia and American Q fever. In the bulk of the cases studied, however, the etiologic agent has not been determined. It seems probable that the last mentioned group has one etiologic common

denominator and that ultimately it will receive a more definitive name. In the interim it is suggested that cases of atypical pneumonia due to the specific causes listed should be referred to with an appropriate specific name such as atypical pneumonia, cause psittacosis, or psittacotic pneumonia when and as diagnostic methods make this possible. The term primary atypical pneumonia should be reserved for the large group of cases of unknown causation. If the cold agglutinin test or some other comparably simple diagnostic laboratory procedure for primary atypical pneumonia, causation undetermined, is found, the differential study of the entire group of atypical pneumonias will be greatly simplified.

The present study is based on an experience with 1,862 cases of primary atypical pneumonia, causation undetermined, treated at the Station Hospital, Jefferson Barracks, Missouri, from June 1, 1942 to Aug. 10, 1943. During this interval 62 cases of lobar pneumonia of pneumococcus origin also were seen. The differential diagnosis of those two conditions was based on bacteriologic studies of the sputum, the white blood count, the x-ray appearance and the clinical course. Occasional cases occurred in which differentiation was difficult and not clearcut, but it is felt that the foregoing figures give a fair picture of the distribution of cases. The possibility that some of the group classified as primary atypical pneumonia, causation undetermined, in reality were atypical pneumonia of known causation was considered and cannot be denied for the entire group. Two hundred patients gave negative reactions to intradermal tests for coccidiomycosis. Facilities for virus studies were not available at this institution. However, owing to the epidemic character of the disease, the absence of environmental or clinical factors suggestive of the disease processes comprising the group of atypical pneumonia of known causation and the results of virus studies of similar groups of cases at other hospitals,¹ it is felt that the majority of the cases in this series were truly of "causation undetermined" and not just of causation undiscovered.

During the period from June 1, 1942 to Aug. 10, 1943 there were no deaths from primary pneumococcal pneumonia. There were 5 deaths in the group of primary atypical pneumonias. One was due to meningococcal meningitis developing in a patient convalescing from primary atypical pneumonia. In 2 cases at autopsy, consolidation was found, with a gross invasion of hemolytic *Staphylococcus aureus* which had not been observed on sputum cultures. It could not be established whether the bacterial invasion was the primary factor in the disease or occurred secondarily to a primary atypical pneumonia, although the evidence at hand favored the latter explanation. The mortality rate in this series of primary atypical pneumonia including these 3 cases was 0.26 per cent.

Read at the Conference of the chiefs of services of the Fourth Service Command, Atlanta, Ga., Aug. 6, 1943.

Prepared under the direction of Col. James R. McDowell, Commanding Officer, Station Hospital, and Post Surgeon, Jefferson Barracks, Missouri.

1. Dingle, John H., and others: Primary Atypical Pneumonia. *Etiology Unknown*, War Med. 3: 223-248 (March) 1943.

2. Dingle, John H., and Finland, Maxwell: Virus Pneumonias: II. Primary Atypical Pneumonia, Unknown Etiology. *New England J. Med.* 227: 378-386 (Sept. 4) 1942. Finland and Dingle.

3. Reimann, Hobart A.: Viral Pneumonia. *Bull. New York Acad. Med.* 19: 177-182 (March) 1943.

4. Seeds, Asa E., and Mazer, Martin L.: Virus Pneumonia: Roentgenographic Characterization of Recent Virus Pneumonitis Bronchopneumonia. *Am. J. Roentgenol.* 49: 30-38 (Jan.) 1943.

5. Campbell, Thomas A.; Strong, P. S.; Grier, G. S., and Lutz, R. J.: Primary Atypical Pneumonia: A Report of 200 Cases at Fort Eustis, Virginia. *J. A. M. A.* 122: 723-730 (July 10) 1943.

6. MacLeod, Colin M.: Primary Atypical Pneumonia. *M. Clin. North America* 27: 670-686 (May) 1943.

PRIMARY ATYPICAL PNEUMONIA: COMMUNICABILITY
AND PRECIPITATING FACTORS

Evidence was obtained which suggests that the susceptibility to primary atypical pneumonia varies greatly.

The majority of the soldiers in this study came to Jefferson Barracks soon after induction into the Army.

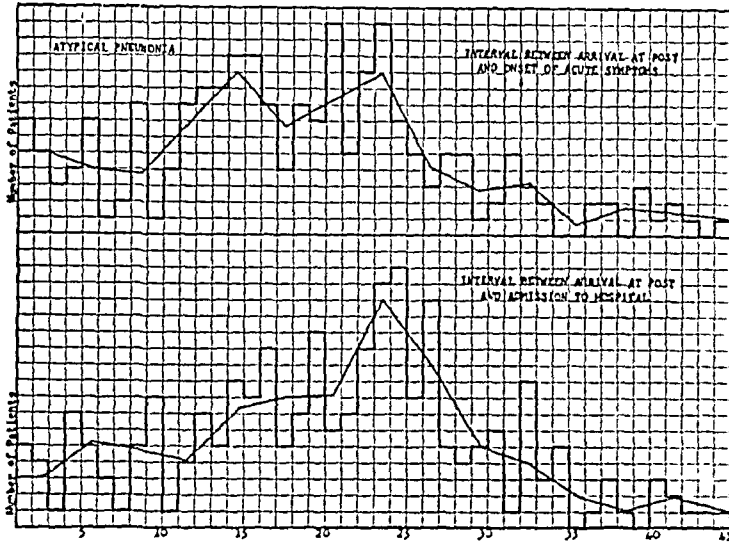


Chart 1.—Onset of acute symptoms and admission to hospital after arrival at post.

During the initial period of adjustment with its attendant fatigue and exposure to an unaccustomed environment the incidence was at its peak. After a period of thirty-five to forty days, however, at Jefferson Barracks a soldier's chances of developing the disease dropped to about one sixteenth of what they were on the twenty-fourth day after his arrival (chart 1). This was apparently due to an improvement in the general physical condition or the development of a specific immunity in the group of men involved. It is felt that the latter factor is the more important.

Reimann³ and Dingle and others⁷ have presented evidence indicating that the etiologic agent of primary atypical pneumonia frequently causes upper respiratory tract disease alone and that the majority of such infections occurring in association with epidemics of primary atypical pneumonia are of this type. "Colds" of varying severity occurred with great regularity in new arrivals at Jefferson Barracks during the period of this study, and if the aforementioned theory is correct it would provide an explanation of the indicated immunity.

Since primary atypical pneumonia is an infectious process presumably air borne, and since it was observed that civilian visitors to patients with this disease in the hospital not infrequently contracted it after moderate periods of exposure, it was considered important to determine the degree of isolation desirable for these patients. Attention was specifically directed to the danger of cross infection in wards to which patients with acute upper respiratory infections were sent, with which group approximately one half of the patients ultimately developing atypical pneumonia were admitted before the true character of their disease had become apparent.

Studies were made of the incidence of primary atypical pneumonia in four 55 bed upper respiratory wards during a two months period. In two wards the

patients developing atypical pneumonia were allowed to remain in the wards for treatment and convalescence. In the other two wards the patients were transferred from the wards as soon as the diagnosis became evident. The number of patients present in the wards was essentially the same. In the first group of wards 58 patients developed pneumonia and in the second group this occurred in 64 instances. It should be emphasized that the majority of these cases of pneumonia were developing at the time of hospitalization, that the diagnosis was established within a short time after admission and that only in comparatively few cases did it appear to have been possibly contracted in the wards. Investigation was also made (in view of the incubation period of primary atypical pneumonia) to determine whether any of the patients in these wards not developing pneumonia did so at a later date following this period of hospitalization. It happened that no such incidents were found. It would appear that patients in these wards with upper respiratory disease alone were not endangered by prolonged exposure in the wards to patients with primary atypical pneumonia.

The theory of a common causation of primary atypical pneumonia and associated cases of upper respiratory tract infection is supported by and probably explains this apparent absence of cross infection. It is not suggested that patients with mild primary atypical pneumonia be allowed to remain intermingled with other patients and it is the policy of this hospital at the present time to transfer them to pneumonia wards for isolation in private rooms as soon as the diagnosis is made. However, in case such exposure should inadvertently occur in wards limited to respiratory tract infection the danger to other patients is apparently slight.

EPIDEMIOLOGY

In this series of cases contacts with insect, avian and animal vectors were so infrequent that they were considered of no possible epidemiologic significance. No evidence appeared to contradict the opinion of others that primary atypical pneumonia is air borne.

INCUBATION PERIOD

The incubation period has been estimated to range from two to twenty-one days or longer (Reimann,³ MacLeod⁶). From an epidemiologic standpoint the one common denominator in the cases of this series was their arrival at Jefferson Barracks from many different points throughout the United States, both civilian and military in character. In chart 1 the intervals between arrival at this post and (a) the development of symptoms of pneumonia and (b) the hospitalization of this same group for pneumonia is charted for 203 consecutive patients. It is felt that the rise beginning on the seventh day represents the initial appearance of cases developing from contacts made after arrival at the post (minimum incubation period) and that the maximum summation reached on the fifteenth day indicates roughly the maximum incubation period.

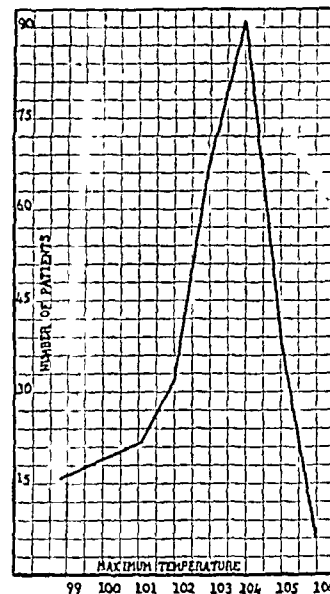


Chart 2.—Maximum temperatures observed in 290 cases.

7. Finland, Maxwell, and Dingle, John H.: Virus Pneumonia: I. Pneumonias Associated with Known Nonbacterial Agents: Influenza, Psittacosis and Q Fever, *New England J. Med.* 227: 342-350 (Aug. 27) 1942.

SYMPTOMATOLOGY AND PHYSICAL FINDINGS

In 297 consecutive cases of primary atypical pneumonia in which the symptoms and physical findings were carefully observed and recorded for statistical purposes the results were quite similar to those reported by previous observers, with the single difference that the disease appeared to be definitely more virulent in this series. This is indicated by the higher maximum temperatures, the greater incidence of chest pain, bloody sputum and complications which these patients developed (chart 2; tables 1 and 2).

Approximately two thirds of this series had a gradual onset with a history of an upper respiratory infection for days or weeks followed by the development of incapacitating malaise, chilliness, fever, cough and chest pain. In one third of the group these symptoms appeared abruptly, requiring early hospitalization. Severe headache was frequently present and at times associated with meningeal signs. Occasionally the possibility of an associated purulent meningitis could be excluded only by spinal puncture.

TABLE 1.—Atypical Pneumonia: Frequency of Occurrence of Symptoms in 297 Cases

	Symptoms	Percentage of Occurrence
Onset	Gradual.....	67.2
	Acute.....	32.8
Constitutional symptoms	Feverishness.....	85.5
	Malaise.....	70.4
	Chilliness.....	63.0
	Headache.....	48.0
	Rigor.....	11.5
Symptoms referable to respiratory tract	Cough.....	86.2
	Sputum	
	Nonbloody.....	49.0
	Blood streaked.....	23.9
	Bloody.....	2.4
	Purine juice.....	0.4
	Coryza.....	49.0
	Sore throat.....	47.0
	Thoracic pain.....	69.5
	Substernal.....	20.4
	Pleural on motion.....	47.7
	Thoracic on rest.....	11.2

Physical findings initially were often confusing. Fever was almost invariably present. The most helpful localizing symptom was the presence of rales (56.2 per cent), which varied in character but most typically were dry and crackling and occurred in showers near the end of inspiration. It was observed that they could often be brought out by coughing when not otherwise present. Dulness to percussion was present in 25 per cent of the cases. Dyspnea was detected in 21.7 per cent and diminished breath sounds in 19 per cent. Signs of consolidation or fluid and the presence of a friction rub were noted infrequently.

The initial diagnosis was frequently one of exclusion as x-ray findings and definite localizing physical signs were not present until several days after the onset of the disease. A summary of the symptoms and physical findings is given in tables 1 and 2.

LABORATORY PROCEDURES OF VALUE IN THE MANAGEMENT OF PRIMARY ATYPICAL PNEUMONIA

As Dingle and others¹ have shown, the white blood cell count and differential counts are of little value in uncomplicated primary atypical pneumonia. The experiences in this series of cases was a similar one. The white blood cell count was usually normal and less frequently slightly elevated. No constant help or significant changes were noted in the differential counts.

Sputum examinations and blood cultures were useful when positive in determining primary or secondary pneumonias of bacterial origin.

Valuable information for controlling the management of these cases can be obtained from sedimentation tests done at weekly (or shorter) intervals. In the acute

TABLE 2.—Atypical Pneumonia: Frequency of Occurrence of Physical Signs in 297 Cases

Signs	Percentage of Occurrence
Fever.....	97.6
Rales.....	56.2
Dulness.....	28.0
Dyspnea.....	21.7
Diminished breath sounds.....	19.0
Consolidation.....	9.8
Friction rub.....	7.7
Fluid.....	6.1
Cyanosis.....	3.6
Meningeal signs.....	0.4

stage of the disease the sedimentation rate is invariably elevated and ranges from 20 to 40 mm. per hour. As the disease improves this gradually returns to normal, and with recurrences or reactivation it shows secondary rises which can be correlated with clinical and x-ray findings.

By the routine use of this sedimentation test it is possible to follow the progress of atypical pneumonia as satisfactorily as by the routine use of periodic chest plates. This substitution is particularly important because of the present shortage of film and the need for conserving this most valuable material. In the uncomplicated case, films are needed only for diagnostic corroboration, and confirmation of pulmonary clearance before discharge.

Table 3 indicates variations in sedimentation rate correlated with temperature, x-ray and clinical findings in a patient with two recurrences.

THERAPEUTICS DURING THE ACUTE STAGE

Therapy during the acute stage of the disease varied from expectant and symptomatic to the use of the sulfonamides in doses large enough to maintain an

TABLE 3.—Atypical Pneumonia: Case of Recurrence

Date	Temperature	X-Ray Diagnosis	W. B. C. ($\times 1,000$)	Sedimentation Rate	Physical Examination
3/16	103	Atypical pneumonia, left base	8.8	25 mm.	Rales, left base
3/20	103.8	.....	4.0	.....	Rales, left base
3/22	99	.....	6.1	11 mm.	Rales, left base
3/24	98.6	No change	...	.....	Rales, left base
4/12	98.6	Slight flareup, left base	...	21 mm.	Rales, left base
4/25	98.6	.....	4.4	14 mm.	Chest clear
4/26	98.6	Resolution not complete	...	.....	Chest clear
5/11	98.6	Chest clear	4.9	7 mm.	Chest clear
5/28	101	.....	...	.....	Rales, left base
6/1	98.6	Recent pneumonia, left base	...	28 mm.	Rales, left base
6/9	98.6	Resolution not complete	...	19 mm.	Rales, left base
6/16	98.6	.....	...	17 mm.	Rales, left base
6/22	98.6	Chest clear	...	8 mm.	Chest clear

adequate level. There was no strikingly effective therapeutic agent found.

Because of its apparent success in some of the more toxic febrile cases observed by two of us (G. C. E. and E. P. R.) its possible effectiveness against secondary invaders and its low toxicity, sulfadiazine was used as the therapeutic constant in all cases in which the temperature rose to 102 F. or higher.

Moderate cough and expectoration was considered a helpful physiologic reaction in the bronchitic and atelectatic aspects of the disease. Therefore ammonium chloride was used as an expectorant, and the sedative and narcotic cough medicines were avoided. (It has been shown by one of us⁸ that the use of narcotics in upper respiratory infections is contraindicated. In a series of upper respiratory infections associated with the present epidemic the incidence of pneumonia was significantly increased in cases treated with opiates [powder of ipecac and opium, Dover's powder].) Rest alone has been enough to quiet the unproductive cough in most cases. Codeine and morphine have been used only in cases of severe cyclic cough which disturbed sleep, in gross hemoptysis and in acute pleural pain.

We have frowned on the use of coal tar antipyretics as ineffectual and misleading. The excessive diaphoresis which accompanies their routine use in atypical pneumonia produces a wasteful loss of salts and fluids and sometimes throws the patient into a depressed debilitated condition which we believe counteracts the very symptomatic relief which is desired. Accordingly,

TABLE 4.—A Comparison of Results of Treatment by Prolonged Bed Rest with Treatment of a Conventional Character

Type of Case	Prolonged Bed Rest		Conventional Management	
	Number of Patients	Average X-Ray Clearance Time	Number of Patients	Average X-Ray Clearance Time
Uncomplicated.....	149 *	30.90	110	34.20
recurrence of pneumonia..	5 † (2.6%)	51.00	41 (23.3%)	51.55
other complications.....	38 ‡ (18.5%)	52.70	38 § (18.5%)	52.00
Total.....	192	33.55	192	41.55

* In 9 cases there was no x-ray evidence of disease. Diagnosis was made on physical findings. These cases not included in computation of average period of x-ray clearance.

† Includes 2 patients who developed effusion during acute stage of disease.

‡ One death and 2 cases of bronchiectasis are not included in computing x-ray clearance time.

§ Three cases of bronchiectasis are not included in computing x-ray clearance time.

acetylsalicylic acid is reserved for symptomatic relief when indicated rather than as a routine measure.

The usual therapeutic indications in pneumonia have governed our use of oxygen, intravenous fluids and blood plasma.

THE MANAGEMENT OF THE ACTIVE (POST-FEBRILE) PERIOD

A very important factor contributing to the long period necessary for recovery of the patients with atypical pneumonia seen at Jefferson Barracks was the frequent recurrences which developed under conventional treatment. A recurrence was arbitrarily defined as a febrile rise of 100 F. or more appearing after ninety-six hours of normal temperature with clinical or x-ray signs of an extension or reactivation of the pulmonary process. Studies were made to determine the optimum method of postfebrile care for the prevention of these complications (other phases of this study are still in progress).

Because of the relatively chronic nature of the pulmonary process in atypical pneumonia and the proved value of rest in pulmonary tuberculosis, it was decided

to determine whether these patients would benefit by a prolongation of the usual postfebrile period of bed rest.

For the purpose of study, our controlled cases were divided into four arbitrary stages: acute (until free from fever for four days), active (until fever free for fourteen days), subsiding (after fourteen afebrile days and until physical examination, x-ray and sedimentation rate were normal) and convalescent (from subsiding stage to full duty).

The following physical arrangements were made: All patients developing pneumonia were transferred to "acute pneumonia wards." On admission to these wards patients were alternately labeled as "ambulatory" or "bed rest" and they retained this designation during their period of hospitalization. The entire group was kept at complete bed rest until they had been free from fever for four days. Then those designated as "ambulatory" and "bed rest" were separated, and each group was sent to a different ward for controlled study. At this point the occasional patients who had been found to have pneumococcic pneumonia were dropped from the series.

The ambulatory group (who had had four afebrile days of bed rest before transfer) were then permitted to get up when and as they felt like doing so, there being no compulsion to do more than appealed to them. In the event of a recurrence or reactivation of the pulmonary process they were returned to the acute pneumonia wards and passed through the cycle of acute treatment again.

The group sent to the "bed rest" ward were kept in bed for an additional ten days (total fourteen days). This period of time was selected arbitrarily. Following this they were permitted to get up when and as they felt like doing so.

After both groups were ambulatory they were transferred to the "subsiding" wards for further care.

The results in this controlled study of 384 cases is summarized in table 4. In the group treated by prolonged bed rest the percentage of recurrence was 2.6 and in the group treated by a conventional type of care the percentage of recurrence was 23.3.

In spite of the delay in becoming ambulatory, the decrease in recurrences reduced the average period of hospitalization in the "bed rest" group to 33.55 days as compared to 41.55 days in the "ambulatory" group.

This procedure was set up for statistical purposes and obviously did not necessarily represent the ideal method of managing the individual patient, as it does not give consideration to variations in the virulence of the disease or the resistance of the individual patient. After the completion of this statistical study we adopted the policy of keeping all patients with active atypical pneumonia at bed rest and isolated until their sedimentation rate has decreased to 10 mm. or less in one half hour.

TREATMENT DURING THE SUBSIDING AND CONVALESCENT STAGES (USE OF CONVALESCENT TRAINING PROGRAM⁹)

Since rest seemed to be so important during the "active" stage of the disease, at the beginning of this study the tendency was to limit activity during the "subsiding stage" as well. Physical rehabilitation was not begun until the pneumonia was entirely resolved. A graduated program of convalescent physical training

8. Rusk, Howard A., and van Ravenswaay, Arie C.: Sulfadiazine in Respiratory Tract Infections: Its Value in Treatment During Winter 1942-1943 at Jefferson Barracks, Missouri, J. A. M. A. 122:495-496 (June 19) 1943.

9. This program is an integral part of the Convalescent Training Program now operating in all Army Air Force hospitals and is administered by a trained group of officers and enlisted men under close medical supervision.

was established in the country (Camp Babler) to which patients were sent after discharge from the Station Hospital. This worked out very well, and patients were returned to duty in much better condition than before this program was instituted. However, by experimentation and observation it was found that it was unnecessary to wait until x-ray and physical findings had completely cleared before beginning physical reconditioning and that patients who had been afebrile for fourteen days could tolerate exercise without reactivation and that clearing by x-ray proceeded as rapidly as it did in those on the less vigorous program.

Ultimately it appeared, as previously stated, that a thirty minute sedimentation reading of 10 mm. or below was a more satisfactory criterion for determining the beginning of the "subsiding" stage than the arbitrary period of fourteen afebrile days. The patient now begins the physical portion of his convalescent training program at this point. The rapidity of his progress on the road to physical rehabilitation is regulated by his exercise tolerance.

At present a twelve day physical reconditioning program in the hospital is used during the "subsiding" phase of the disease. In this the first five days are a preconvalescent or test period. If the exercise tolerance is good and the sedimentation rate continues to drop during this test period, the patient continues with increasing stages of physical activity to approximate general military duty by the twelfth day of the program. When the sedimentation rate at sixty minutes is 10 mm. or below and exercise tolerance is excellent, the final x-ray film is taken before discharge to duty. Organized lectures, demonstrations, movies and entertainment are a part of the convalescent program. Thus, manpower hours of useful training are salvaged and morale is maintained. The patients are enthusiastic, ward morale is high, manpower conservation gratifying. The individual convalescent is observed and regulated by his ward officer during the program, and his exercise tolerance evaluated before general duties are assumed.

By means of the sedimentation rate we have been able to anticipate x-ray clearance and exercise tolerance so that clear chest plates, normal sedimentation and full duty exercise tolerance all obtain at nearly the same time. This has saved two or three weeks of noneffective days per patient.

The study has given us some insight into the behavior of the infectious process in the various stages. The "acute" stage appears to be the most infectious; the "active" stage is still infectious and is accompanied by lowered resistance, as is shown by reactivation with exercise and cross infection. The "subsiding" stage is apparently noninfectious, resistance is raised against cross infection; graduated exercise is well tolerated so that full activity may be achieved by the time the x-ray film is clear, when a proper program is provided and the patient carefully followed.

COMPLICATIONS

That the atypical pneumonia of Jefferson Barracks of 1942-1943 has been more virulent than most reported series is borne out by the greater number of acute and seriously ill patients, increased x-ray clearance time (table 5), increased frequency of bloody sputum, cyanosis and chest pain, as well as complications. Of 493 consecutive patients admitted after March 10, 1943 (378 of whom had been discharged by August 10) the most frequent complication was the development of pleural fluid. There were 48 (9.7 per cent) cases

corroborated by x-ray examination; of those 13 (2.6 per cent) showed massive effusions requiring thoracentesis and of the latter number 7 (1.4 per cent) in which empyema developed requiring surgery (rib resection). The importance of these pleural complications can be measured in hospital days. While thirty-two days was the average time for chest clearance by x-ray examination in the uncomplicated cases, pleural effusion, even minimal, raised the figure to forty-six days. Empyema with its incident operations and slow healing raised the figure to two and one-half to four months, not counting the necessary prolonged convalescent period before active duty. Recurrence and reactivation carried with them an average x-ray clearance time of fifty-two days. These complications occurred in 23 per cent of these patients who were permitted to become ambulatory after being afebrile for four days and in only 2.6 per cent of those treated with prolonged bed rest. The inevitable conclusion is that atypical pneumonia patients should be treated in bed until the sedimentation rate shows quiescence.

Residual localized chronic bronchitis and bronchiectasis were serious complications which occasionally

TABLE 5.—Summary of Complications Arising in 493 Consecutive Cases of Primary Atypical Pneumonia from March 10 to Aug. 20, 1943

Type of Case	Number	Per Cent	X-Ray Clearance Time *
Uncomplicated.....	315	63.8	32.15
Recurrence.....	60	12.1	52
Effusion.....	41	9.7	51
Massive effusion.....	13	2.6	
Empyema.....	7	1.4	
Bronchiectasis.....	11	2.2	98 †
Localized postpneumonic chronic bronchitis.....	3	0.6	
Chronic fibrous pleuritis with deformity....	2	0.4	
Hemoptysis (gross).....	1	0.2	
Measles.....	12	2.4	55
Others.....	4	0.8	16
Deaths.....	6	1.2	13
Others.....	2	0.4	
Others.....	36	7.2	
Total.....	493	100.00	

* These figures are based on patients discharged from the hospital with clear x-ray films by Aug. 10, 1943.

† In this instance 98 days represents the average period of hospitalization before discharge with x-ray diagnosis of bronchiectasis.

occurred. There were 3 cases of the former and 11 of the latter. Both were characterized by persistence of cough and expectoration, especially in the morning, and poor exercise tolerance. Physically and roentgenologically the two conditions are indistinguishable. The bronchogram alone can differentiate them. Physical findings invariably showed a definitely localized area of moist and bronchial rales, with or without dullness. X-ray films either were normal or showed increased bronchial markings in the area or a persistent shadow, interpreted as unresolved pneumonia. These complicating processes did not prevent the characteristic return to normal of the sedimentation rate coincident with the resolution of the initial pneumonic process. The bronchogram revealed the local damage in the cases of bronchiectasis and showed a relatively normal bronchial tree with more or less peribronchial infiltration in the cases of chronic residual bronchitis. Whether the latter group will ultimately develop bronchiectasis cannot be predicted. We recognize these cases as troublesome, manpower wasting and relatively intractable to therapy. Seven of the 11 patients in the bronchiectasis group gave a history of intermittent or continual chronic dry or productive cough extending over months to years.

which was compatible with preexisting bronchiectasis. The remainder had no past history suggestive of chronic pulmonary pathologic changes. In the absence of a suitable x-ray examination before the onset of the atypical pneumonia it is impossible to determine accurately how many of this group had preexisting bronchial damage. It seems probable that at least 4 developed bronchiectasis during their hospitalization. Certainly all are incapacitated now by poor exercise tolerance, when previously they could exercise vigorously without symptoms.

In this series 2 cases of thin walled abscesses developed. Acid fast and coccidiomycotic factors were ruled out. The patients are still under observation and appear to be making spontaneous recovery, although full x-ray clearance has not been obtained. There was 1 patient with unexplained massive and continued hemoptysis requiring three blood transfusions. This patient has now returned to full duty with complete healing.

In the controlled group 2 cases of nonspecific urethritis (presumed to be viral in etiology since no bacterial cause could be found) and 1 case of Stephens-Johnson syndrome (conjunctivitis, and stomatitis associated with atypical virus pneumonia) represented the only extrapulmonic complications of our series.

There were 2 patients with acute abdominal localization of pain who were conservatively followed by the surgical department. Atypical pneumonia apparently accounted for all their symptoms.

INTERCURRENT INFECTIONS

The study of intercurrent infections in our controlled series has revealed some interesting figures, which may point the way to rational therapy for atypical pneumonia. These figures do not lend themselves to absolute statistical evaluation in all cases but suggest a trend which we believe is possibly significant. Remembering that the x-ray clearance time of uncomplicated cases was approximately thirty-two days, the presence of measles, red or German, raised that time to from forty-three to seventy-three days (average fifty-five days for 12 patients). Syphilis, another depressor of resistance and white blood cell count, was accompanied by very slow clearing, as would be expected. However, streptococcal diseases, scarlet fever and streptococcal pharyngitis had a much shorter period of clearance, varying from ten to fourteen days (average thirteen days for 6 patients). Cases accompanied by acute otitis media showed an x-ray clearance period of six to twenty days (average sixteen days for 4 patients). We have noticed in our series of cases of primary atypical pneumonias that those patients with higher degrees of fever and higher white blood cell count cleared more quickly and that a rising white blood cell count was a good prognostic sign. Will raising fever or maintaining it and stimulating polymorphonuclear response constitute a helpful alternative effect? We are about to investigate these possibilities.

CONCLUSIONS

1. The primary atypical pneumonia, causation undetermined, seen in 1,862 cases at Jefferson Barracks during the period from June 1, 1943 to Aug. 10, 1943 was more virulent than in other reported series.

2. For optimum results the clinical management of primary atypical pneumonia of the type seen at Jefferson Barracks during the past year should include a more prolonged period of postfebrile bed rest than ordinarily is indicated in pneumococcal pneumonia of similar age groups.

3. The determination of the sedimentation rate is a useful laboratory procedure for following the course of this disease.

4. The judicious use of a physical reconditioning program during the subsiding and convalescent phases of primary atypical pneumonia is an important adjunct in shortening hospitalization and reducing the incidence of recurrence.

THERAPEUTIC CURE OF ACUTE EXPERIMENTAL TOXOPLASMOSIS IN ANIMALS

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The disease toxoplasmosis is almost invariably fatal in man. Therapy has been unsuccessful; in the few recoveries which have occurred there is no convincing evidence that this outcome was appreciably influenced by the nonspecific medication employed. A principal cause for failure of therapy may well have been the short period in which the patients were available for treatment, since death has often followed the appearance of the initial symptoms within a few days. Practically, therefore, decidedly beneficial results in man may be expected only from those drugs which in animals have experimentally been proved effective when administered during the acute disease and shortly before death.

In this report it will be shown that appropriate sulfonamides will cure a high percentage of otherwise fatally infected animals even when treatment is instituted a few days before the date of expected death. It is felt that these results warrant thorough trial of the same treatment in human cases.

The first record, to our knowledge, that the sulfonamides were at all effective in vivo is that of Sabin and Warren.¹ These authors experimented with mice, adding different sulfonamides to the diet. They observed a notable prophylactic effect but were unable to effect cures if administration of the drug was delayed beyond the second day after infection. Carried over to man, this would signify probable ineffectiveness once symptoms were present. Five rabbits were treated as late as the third day after infection; 3 which received drug in the diet died, while 2 injected intraperitoneally survived. Study of the data of these authors suggested that blood levels adequate for maximum benefit may not have been obtained, so that the method of administration rather than ineffectiveness of the drug was primarily responsible for the unsatisfactory results. The present study was undertaken to test this very point.

METHODS AND MATERIALS

In order to reproduce the conditions in which human patients become available for treatment, therapy was initiated late in the course of the infection. The period of expected survival was determined and the initial dose given to some animals at the expiration of the first third of this period, to others at the end of the second third, and others received it at various later intervals.

From the Department of Comparative Pathology and Tropical Medicine, Harvard Schools of Medicine and Public Health.

1. Sabin, A. B., and Warren, Joel: Therapeutic Effect of the Sulfonamides on Infection by an Intracellular Protozoan (*Toxoplasma*), *J. Bact.* **41**: 80 (Jan.) 1941; Therapeutic Effectiveness of Certain Sulfonamides on Infection by an Intracellular Protozoan (*Toxoplasma*), *Proc. Soc. Exper. Biol. & Med.* **51**: 19-23 (Oct.) 1942.

Sulfapyridine, sulfathiazole and sulfadiazine were suspended in cottonseed oil and injected subcutaneously; the more soluble sodium salts, after dissolution in saline solution, were injected intraperitoneally. Administration was either twice daily at twelve hour intervals or in some instances three times a day spaced eight hours apart. Blood levels of the drugs were determined by the methods described by Bratton and Marshall.²

The toxoplasma strain, originally isolated from guinea pigs, is regularly fatal to mice following intraperitoneal injection of adequate doses. This route was used for all the mice reported. In the case of this organism it is impossible to state in a very exact way

RESULTS

With the first series of infected animals, treatment was delayed until the fifth day after infection. Untreated controls died in an average of fifteen days. In other words, treatment was begun at the expiration of one-third the period of expected survival.

The results with sulfapyridine were strikingly successful. Of 17 mice treated with sulfapyridine in oil or with sodium sulfapyridine, 16 survived throughout the observation period, which was set at twenty-eight days, being a convenient period nearly double that in which the average control death occurred. This represents a therapeutic cure rate of 95 per cent. Of the 6 untreated controls, 1 unexpectedly recovered and

TABLE 1.—First Series

Drug	Number of Mice	Day Treatment Began *	Daily Dose per Mouse	Period of Therapy	Blood Levels			Survivors Observation Period (28 Days)
					Day of Treatment	Hours After Infection	Mg. Drug 100 Cc. Blood	
Sodium sulfapyridine	6 (4350)	5	2 × 0.010 Gm. for one day = 0.02/day 3 × 0.010 Gm. for two days = 0.03/day 2 × 0.010 Gm. for three days = 0.02/day	Six days	...	..	....	6
	5 (4349)	5	2 × 0.010 Gm. for one day = 0.02/day 3 × 0.010 Gm. for two days = 0.03/day 2 × 0.010 Gm. for six days = 0.02/day	Nine days	2	6½	15.0	4
				Nine days	5	3	25.0	
					7	7½	11.0	
					7	12	10.5 (approx.)	
Sulfapyridine in oil	6 (4345)	5	2 × 0.015 Gm. for nine days = 0.03/day	Nine days	5	3	7-15.6	6
Controls	6 (4344)	None	None	None	...	..	....	1
Average death 15.2 days								

* Counted from and including the day of infection.

TABLE 2.—Second Series

Drug	Day of First Dose *	Number of Mice	Daily Dose	Period of Administration	Outcome
Sulfapyridine in oil	10	2	0.015 Gm. × 2 at 12-hour intervals = 0.03/day	9 days	1 survived 85 days
	12	1	0.015 Gm. × 2 at 12-hour intervals = 0.03/day	3 days	Dead 13th day (treatment ineffective)
	13	2	0.015 Gm. × 2 at 12-hour intervals = 0.03/day	7 days	Dead 20th day (treatment ineffective)
	14	1	0.015 Gm. × 2 at 12-hour intervals = 0.03/day	5 days	2 survived 85 days
Sulfathiazole in oil	10	2	0.02 Gm. × 2 at 12-hour intervals = 0.04/day	5 days	Dead 17th day (treatment ineffective)
	12	1	0.02 Gm. × 2 at 12-hour intervals = 0.04/day	2 days	All died as if untreated within 24-48 hours after first dose †
	13	1	0.02 Gm. × 2 at 12-hour intervals = 0.04/day	1 day	
	14	2	0.02 Gm. × 2 at 12-hour intervals = 0.04/day	1 day	
None (control group)	..	5	0	.....	No recoveries; average death 16 days

* Counted from and including the day of infection.

† Sulfathiazole blood levels (uninfected mice) 7 hours after last injection 7.95 to 9.45 mg. per hundred cubic centimeters of blood; 12 hours after, 10.3 to 10.5 mg. per hundred cubic centimeters.

the injected doses, since the infective agents are not distributed uniformly in an inoculum or freed from the tissue in which they occur. Nonetheless an approximation was obtained for the mice reported in series 1 by the progressive dilution method, an inoculum of 0.5 cc., as in the therapy experiments, but diluted 1:20,000 still proving fatal. The average survival period of the dying untreated controls in series 1 was fifteen days. In series 2 the dilution method was not employed; since, however, untreated controls died in sixteen days, the infective dose was probably of the same magnitude in the two series.

At the conclusion of the experiment survivors were tested for chronic infection by direct examination of the brain. This, if negative, was complemented by inoculation of mice with other portions of the same brain.

the others died, the spontaneous recovery rate being 17 per cent. Details of treatment are given in table 1.

These results were so promising that we were led to see how late in the infection therapy might still be effectively instituted. In this second series the 5 controls died in an average period of sixteen days. The treated mice received sulfapyridine in oil ten, twelve, thirteen or fourteen days after infection. Of the 6 treated mice in this set half died in the same period as the controls, but 50 per cent survived during an observation period prolonged in this instance to eighty-five days. Of these mice, 2 received the first treatment as late as the thirteenth day after infection, that is, three days before their anticipated death; both recovered, as may be seen in table 2.

In all these experiments the period of administration of the drug varied from six to nine days. There is no indication that the longer period was advantageous therapeutically, and, since the drugs are toxic, the shorter period is to be preferred.

2. Bratton, A. C., and Marshall, E. C., Jr.: A New Coupling Component for Sulfanilamide Determination, *J. Biol. Chem.* **128**: 537-550 (May) 1939

Blood levels with sodium sulfapyridine varied between 10.5 and 25.0 mg. in 100 cc. of blood. In terms of milligrams per hundred cubic centimeters, at different intervals after injection, the blood levels on the twice daily schedule were at 3 hours 25.0, at 6½ hours 15.0, at 7½ hours 11.0 and at 12 hours approximately 10.5. With sulfapyridine in oil given at noon and midnight, the blood levels did not rise as high or drop as low as with the sodium salt. Three hours after injection the blood level varied between 7.0 and 15.6 mg. per hundred cubic centimeters, at 5½ hours it was 15.0 and at 11 hours 12.2.

Trials with other sulfonamides were not sufficiently extensive to permit of any final conclusion. With sodium sulfadiazine we were able to cure nearly all mice of a small batch when treatment was commenced the fifth day. It is of particular interest that this result was obtained after only three days of treatment, the mice receiving 0.02 Gm. the fifth day in two equal doses twelve hours apart, 0.03 Gm. on the sixth in three equal doses at intervals of eight hours, and a single dose of 0.01 Gm. on the seventh day. While these results are encouraging, the amounts injected, although reported to be safe, were found to be dangerously near the toxic dose, blood levels rising to above 20 mg. per hundred cubic centimeters three hours after injection. It is possible that smaller safer doses might prove effective. Sulfathiazole in oil started on the tenth, twelfth, thirteenth or fourteenth days after infection cured no mice; the blood levels obtained, 8.75 mg. per hundred cubic centimeters at 7 hours and 10.4 at 12 hours, were perhaps too low for maximum benefit. As already noted, mice treated with fapyridine ten to fourteen days after infection were ed in about half the cases; however, the blood ncentrations attained varied between 7.0 and 15.6 mg. per hundred cubic centimeters.

CHRONIC INFECTION OF CURED MICE

Recently one of us has shown³ that mice receiving very small doses of virulent toxoplasmas will recover but remain carriers, the infection persisting as an inapparent one for long periods of time. When the carriers died or were killed and the viscera examined, the brain in every instance was found to be heavily infected with living virulent organisms. Other data were presented which indicate that the carrier state may exist in man.

The question naturally arose whether in the present experiments the sulfonamides in effecting a cure of the disease eradicated the infection or only aided in producing the carrier state. The evidence is unequivocal; we have no proved case of sterilization of the infection, for in every instance tested the cured mice were found to be carriers. The toxoplasmas were present in the brain, being usually quite numerous and shown in every test to be virulent by passage to new mice.

This result was obtained whatever the drugs used: sulfapyridine, sodium sulfapyridine, sodium sulfadiazine and sulfathiazole. It also seemed to be independent of the length of the period of administration as well as of the dose of drug and was found to occur even in experiments (not otherwise reported in this paper) in which the drug was given prophylactically before infecting the animals. It seems justified to conclude, therefore, that the sulfonamides cannot be relied on to eradicate the carrier state.

CONCLUSIONS

1. Sulfapyridine is strikingly successful in curing acute toxoplasmosis in mice.
2. The recovery rate is the higher the earlier in the course of the disease treatment is started. When treatment is initiated at the expiration of one-third the period of expected survival, nearly all animals recover. If treatment is delayed beyond the end of the second third of this period, only half the animals survive. However, some animals are cured by sulfapyridine administered as late as three days before expected death.
3. Therapy cures the disease but it does not sterilize the infection. The cured mice remain carriers and retain virulent organisms in the brain.
4. The results appear to warrant use of the sulfonamides in treating human acute toxoplasmosis.

SULFADIAZINE IN THE TREATMENT OF THE COMMON COLD

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The common cold derives its medical importance chiefly from the fact that it is followed so frequently by secondary infection. The uncomplicated cold, now generally accepted as caused by a filtrable virus, runs a mild course, usually afebrile, and clears up completely in four to seven days. On the other hand, a cold complicated by a secondary bacterial infection which may involve the sinuses, middle ear, mastoids, larynx or lungs can lead to a fatal outcome. It is evident, therefore, that the cold problem would be greatly simplified if all colds could be retained in the uncomplicated form by some relatively harmless medication. The value that sulfadiazine, the least toxic of the sulfonamides, might have in this role is the consideration of this study.

It is generally agreed that the sulfonamides have little or no effect on the virus initiating the common cold, but it has been accepted that they are effective agents against the pneumococcus and the hemolytic streptococcus. Also there is evidence that they are effective, but to a lower degree, against *Haemophilus influenzae* and the hemolytic staphylococcus, the other two most common secondary invaders of the respiratory tract following colds.

The literature on the use of the sulfonamides in acute coryza per se is comparatively meager, although its use in localized disease of the respiratory tract following colds is quite extensive. But even in such common conditions as tonsillitis and sinusitis there is no unanimity of opinion regarding the indications and value of the sulfonamides. In 1937 Long and Bliss¹ reported favorably on the use of sulfanilamide by mouth in acute pharyngitis and tonsillitis. On the other hand,

From the Medical Service of the New York Hospital and the Departments of Medicine and Public Health and Preventive Medicine of Cornell University Medical College.

1. Long, P. H., and Bliss, Eleanor A.: Para-Aminobenzenesulfonamide and Its Derivatives: Clinical Observations on Their Use in the Treatment of Infections Due to Beta Hemolytic Streptococci, *Arch. Surg.* **34**: 351 (Feb.) 1937.

3. Weinman, David: Chronic Toxoplasmosis, *J. Infect. Dis.* **73**: 85-92 (July-Aug.) 1943.

Rhoads and Afremow² in a controlled series of cases of pharyngitis and tonsillitis found that sulfanilamide did not lessen the severity of symptoms, reduce the incidence of complications or shorten the duration of the carrier state. Kernan³ found that sulfanilamide orally did not alter the ordinary course of tonsillitis but that complications were fewer when it was used. This opinion is the one most commonly accepted today, even though there have been improvements in sulfonamide therapy through the introduction of drugs more effective and less toxic than sulfanilamide.

In sinusitis there is particularly great divergence of opinion on the value of the sulfonamides. Turnbull⁴ reported that a large proportion of patients with chronic sinusitis were benefited by spraying the nasal cavities with a 5 per cent solution of sodium sulfathiazole. No untoward effects were observed in Turnbull's series of 47 cases. This enthusiasm for the local use of the sulfonamides in chronic sinus infection has not been borne out by later reports, and there have been studies indicating that a 5 per cent sodium sulfathiazole solution is deleterious to the mucous membranes. Gundrum⁵ tested the effect of sulfonamide preparations on the nasal mucous membrane of rabbits and found that sodium sulfathiazole in 4.7 per cent solution was locally destructive following nasal instillation. Sodium sulfadiazine, while not so frankly destructive, was also injurious. Otolaryngologists are in greater accord on the value of the sulfonamides in acute sinusitis and in acute otitis media. Bowers⁶ believes that they exert their effect most strikingly in fulminating sinus infections and that in acute otitis media, if oral chemotherapy is instituted early, the duration of discharge and the number of mastoidectomies are both reduced by 50 per cent. For local use Bowers⁶ prefers sulfadiazine or sulfathiazole powder applied directly to the mucous membranes. Silcox and Schenk⁷ have used a 5 per cent suspension of microcrystalline sulfathiazole for the treatment of acute and chronic sinusitis, the suspension being instilled directly into the sinuses. In addition to the differences of opinion over the relative value and safety of the different sulfonamides in their crystalline and liquid forms, the relative value and safety of oral and local administration remains highly controversial.

The value of the routine use of the sulfonamides in the treatment of the common cold has been widely speculated on in medical circles, but very little detailed investigation has been carried out on this problem. Bordley, Crowe, Dolowitz and Pickrell⁸ at Johns Hopkins Hospital treated a small alternate group of nurses coming down with colds by spraying the pharynx and nasal passages with a 2.5 per cent sulfadiazine in 8 per cent triethanolamine solution. In addition to definite symptomatic relief they observed a reduction in complications and a decrease in the secondary bacterial

invaders in the nasopharynx, particularly the hemolytic streptococcus. While this study is very suggestive, it is not convincing because of the small number of cases included. Furthermore, the method of treatment reported is not entirely practical because in order to obtain results it is necessary to spray the pharynx eight times daily for the first two days and then five or six times for three days.

Rusk and van Ravenswaay⁹ have recently published their results on the oral use of sulfadiazine in the treatment of acute febrile respiratory infections which were seen in a large army station hospital during the winter of 1942-1943. Doses of drug (3.0 Gm. initially followed by 1.0 Gm. every four hours) similar to those used in pneumonia were administered until improvement occurred. In the 317 treated patients compared with 314 comparable controls the authors observed no significant difference in either the length of the febrile period or in the period of hospitalization. Contrariwise, Siegel¹⁰ observed decided differences with and without sulfadiazine in alternate groups of feeble-minded children with acute febrile respiratory infections, to which such individuals are particularly susceptible. In this reported series the incidence of serious secondary infections and the duration of the febrile period were considerably lessened.

This brief summary of the literature indicates that the exact role of the sulfonamides in the treatment of upper respiratory infections has not been accurately determined. Our purpose in this study has been (1) to determine the effects of small oral doses of sulfadiazine on the nasopharyngeal flora of persons suffering from acute coryza and (2) to ascertain, if possible, the indications for the use of sulfonamide therapy in upper respiratory tract infection, estimating the benefits to be expected in such cases from this therapy.

METHOD

The subjects were volunteers from the personnel of the New York Hospital.¹¹ They attended a "cold clinic" where they could be studied and treated systematically. To the majority of them colds had become a serious problem because of their frequency and severity.

At the beginning of observation a detailed respiratory history was taken and a careful examination¹² of the upper respiratory tract was made. At the start of therapy and every second or third day during the follow-up, the following procedures were carried out:

1. Oral temperature.
2. Complete blood count on all those actually receiving sulfadiazine, and hemoglobin determination on the others.
3. Record of symptoms with their intensity at time of visit
4. Examination of the upper respiratory tract.
5. Nasopharyngeal culture.

In addition, gross and microscopic urine examinations were made at the start, and later examinations were made if there was indication for them. Also the levels of sulfadiazine in the blood were determined twice during the course of therapy by a micromodification of the

2. Rhoads, P. S., and Afremow, N. S. Sulfanilamide in Treatment of Sore Throat Due to Hemolytic Streptococci, *J. A. M. A.* **114**:942 (March 16) 1940.

3. Kernan, J. D. Infections of the Mouth, Pharynx and Upper Respiratory Tract, *Bull. New York Acad. Med.* **17**: 674 (Sept.) 1941.

4. Turnbull, F. M. Intranasal Therapy with Sodium Salt of Sulfathiazole in Chronic Sinusitis, *J. A. M. A.* **116**: 1899 (April 26) 1941.

5. Gundrum, L. K. Effect of the Newer Sulfanilamide Derivatives on the Nasal Mucosa of Rabbits, *Arch. Otolaryng.* **37**: 209 (Feb.) 1943.

6. Bowers, W. C.: Infections of the Middle Ear and Nasal Sinuses, Preventive Medicine in Modern Practice (edited under the auspices of the Committee on Public Health Relations, New York Acad. Med.), p. 525, New York, Paul B. Hoeber, Inc., 1942.

7. Silcox, L. E., and Schenk, H. P.: Use in Otolaryngology of Microcrystals of Drugs of the Sulfanilamide Group, *Arch. Otolaryng.* **36**: 171 (Aug.) 1942.

8. Bordley, J. E.; Crowe, S. J.; Dolowitz, D. A., and Pickrell, K. L. The Local Use of the Sulfonamides, Gramicidin (Tyrothricin) and Penicillin in Otolaryngology, *Ann. Otol., Rhin. & Laryng.* **51**: 936 (Dec.) 1942.

9. Rusk, H. A., and van Ravenswaay, A. C. Sulfadiazine in Respiratory Tract Infections: Its Value in Treatment During Winter of 1942-1943 at Jefferson Barracks, Missouri, *J. A. M. A.* **122**: 495 (June 19) 1943.

10. Siegel, Morris: Studies on Control of Acute Infections of Respiratory Tract: Oral Administration of Sulfadiazine at the Onset of Acute Respiratory Illnesses, *Am. J. Dis. Child.* **66**: 114 (Aug.) 1943.

11. Our subjects were directed to us through the courtesy and cooperation of Dr. Marian Tyndall of the Nurses Health Service and Dr. Frank M. Falconer of the Hospital Personnel Clinic.

12. These examinations were made by Dr. James A. Moore of the Department of Otolaryngology.

Bratton and Marshall method.¹³ This procedure served as an excellent check as to whether the subject was taking the drug as directed.

The treatment as far as the patients knew was the same in all cases. In addition to written directions for the usual symptomatic and hygienic measures they all received an envelop containing 24 tablets with instructions to take 2 immediately and then 2 three times daily (on rising, at midday and at bedtime) until the medicine was gone. At the start of the study all of the subjects

Nasopharyngeal cultures were taken at the time therapy was initiated and at frequent intervals (usually every second day) thereafter in order to determine the changes that occurred in the nasopharyngeal flora following the therapy.

CULTURE TECHNIC

A small cotton swab on a curved malleable aluminum wire was inserted into the posterior nasopharynx. West tubes were not used, as it is possible with skill to avoid contamination of the swab with the saliva. The swab was put in a tube of 3 cc. of hormone blood broth. With as little delay as possible a measured amount of this infected broth was spread directly on blood hormone agar plates. The blood broth after incubation for four hours, was also injected intraperitoneally into white mice as a further check on prevalence of the pneumococcus types and other pathogens. The blood agar plates were incubated for forty-eight hours and read. An attempt was made to estimate the number as well as the type of the various pathogenic agents that were encountered. For example, if *Haemophilus influenzae* (Pfeiffer's bacillus) was encountered the approximate number and relative proportion of these organisms on the plate were determined. The total count and the prevalence of individual pathogens were compared with the findings in each subsequent culture. Serial cultures made it possible to determine any change in either quantity or quality of the organisms found in the nasopharyngeal cultures.

INITIAL CONTROL STUDY

Before initiating the therapy of persons with colds, we gave the drug to a group of 6 normal subjects. Nasopharyngeal cultures were obtained daily to determine the effect of sulfadiazine on normal nasopharyngeal flora. This work was done in August, when pathogens such as pneumococci and beta hemolytic streptococci are normally at a low level in the throat. The striking features of this initial study were:

1. The uniformity of character and relative distribution of various nasopharyngeal organisms in the throat of any given individual.
2. The pronounced reduction of normal nasopharyngeal flora that followed administration of sulfadiazine. When the blood level reached a concentration of 4 to 6 mg. per hundred cubic centimeters the effect of the drug was clearcut.
3. The rapid return of flora to former prevalence and relative distribution within two or three days after the drug was discontinued.

The results of a typical experiment are summarized in figures 1 and 2. In the first illustration photomicrographs of daily blood agar plates from 1 subject show the decrease in the normal nasopharyngeal flora following the administration of sulfadiazine 1 Gm. three times daily for four days. Figure 2 shows the total colony count and correlates it with the dosage and blood levels of sulfadiazine. These illustrations show a striking change during the period of treatment but rapid return of the organisms to their normal pattern after the cessation of drug treatment.

ALTERNATE CASE STUDY

Seventy-two separate colds in 66 persons were treated in the "cold clinic" and carried through a complete series of bacteriologic and clinical observations. In the 72 cases the 3.0 Gm. daily dosage of sulfadiazine was administered to 48 subjects and acceptable blood

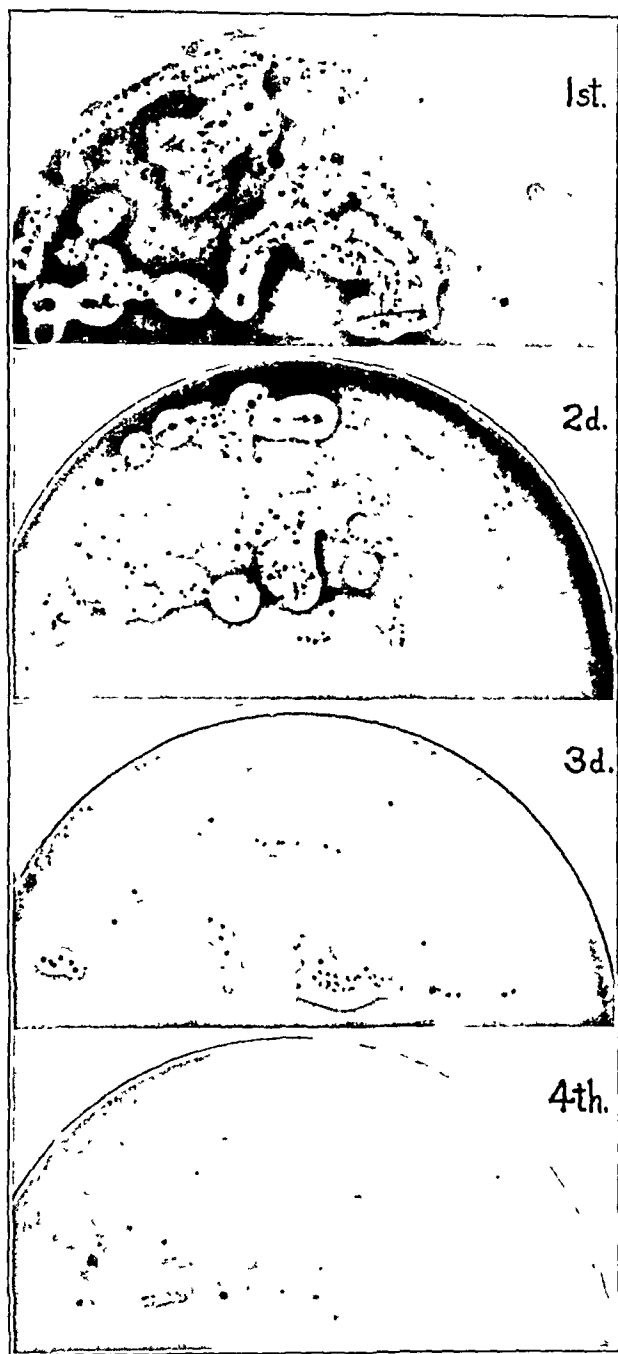


Fig. 1.—Decrease in normal nasopharyngeal flora following oral administration of sulfadiazine 3 Gm. daily for four days.

received sulfadiazine, which meant that they received 1.0 Gm. three times daily for four days, or a total amount of 12 Gm. During the latter part of the study alternate patients received a placebo tablet which could not be distinguished from the drug. The treatment usually was commenced on about the second or third day of the cold when symptoms were established, but a few late cases also were included. The period of time covered by this study extended from October 1941 to June 1942.

13. Bratton, A. C., and Marshall, E. K., Jr.: A New Coupling Component for Sulfanilamide Determination, *J. Biol. Chem.* 128: 537 (May) 1939.

sulfonamide readings were made. Nineteen received the control tablets and 5 were given sulfadiazine tablets but the blood level determinations indicated either that the drug was not taken or that it was not absorbed. Therefore, at the start, the cases can be divided into

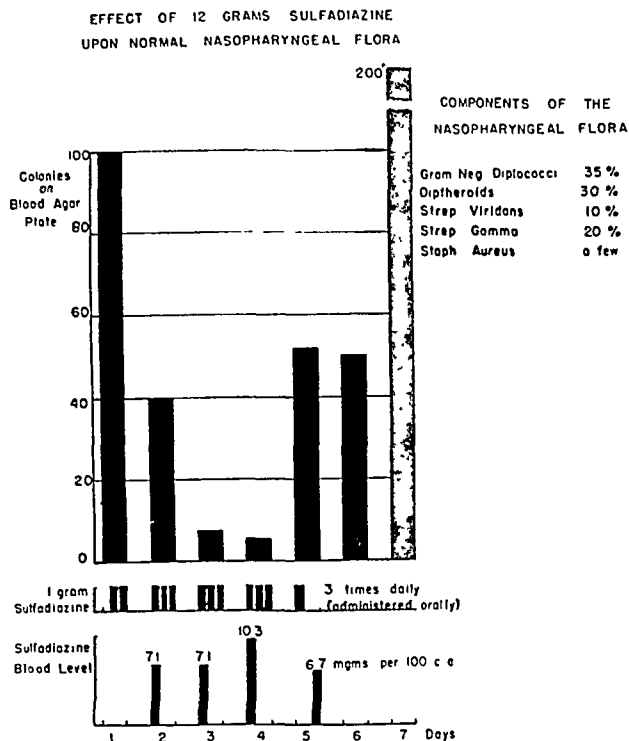


Fig. 2.—Effect of 12 Gm. of sulfadiazine on normal nasopharyngeal flora.

two groups; 48 in which sulfadiazine was administered and 24 in which specific therapy was not administered.

Before analyzing the results in the cases in which sulfadiazine was administered it seemed wise to create a base line for comparison by studying the control series. This group included 24 patients: 19 assigned originally to the control group and 5 from the treated series who, it was evident, did not take or absorb the drug. The bacteriologic findings from the nasopharyngeal cultures in these cases followed a pattern already described by Smillie.¹⁴ Early in the cold and during the stage of the watery secretion from the upper respiratory tract the total bacterial count was reduced. However, after this the total count increased, frequently with a definite predominance of one or more of the pathogens such as the pneumococcus, beta hemolytic streptococcus or *Haemophilus influenzae*. Of the 24 cases, 4 showed a combination of pneumococcus (types 3, 8, 20 and 21) and *H. influenzae*, which during the height of the infection appeared on the plates in large numbers. In 8 cases the pneumococcus (types 6, 8, 11, 20 and 31) was isolated in the first examination. The pneumococcus grew out in increased numbers in all instances but 1, in which it disappeared. *Haemophilus influenzae* was present alone four times and in 2 cases showed increasing numbers on the subsequent cultures. The remaining 8 control cases showed only the usual throat organisms, but in all of these the growth increased during the period of the infection, after the transient decrease.

14. Burky, E. L., and Smillie, W. G.: Nasopharyngeal Flora in Health and During Respiratory Disease in Isolated Communities in Alabama and Labrador, *J. Exper. Med.* 50: 643 (Nov.) 1929.

Clinically these 24 patients showed an ordinary run of colds. Several lost time from work, 1 because of a secondary tonsillitis and another because of severe bronchitis and sinusitis with fever. Six developed a moderate but short lasting sinusitis and 2 had a moderate bronchitis. The colds of 11 patients were uncomplicated except that 3 had prolonged sore throats. Three gave such vague descriptions of their symptoms that they could not be used in appraisal of the clinical findings.

A diagrammatic representation of the course of symptoms and changing nasopharyngeal flora in a control case is shown in figure 3. A key to symbols for symptoms and organisms adjoins this graph. In following symptoms, particular attention was given to malaise, sore throat, rhinorrhea, sinus congestion, hoarseness and cough, and each of these symptoms when present was graded as to whether it was slight, moderate or severe. The organisms that were most carefully identified and included in the graphs are pneumococcus, beta hemolytic streptococcus, *H. influenzae* and hemolytic *Staphylococcus aureus*. *Staphylococcus albus*, alpha and gamma streptococci and diphtheroids were almost universally present in the nasopharynx.

Figure 3 (M. H.) shows the onset with slight malaise, sore throat, rhinorrhea, hoarseness and cough. On the second day the sore throat and rhinorrhea became moderately severe, and on the fifth day the malaise also increased. These symptoms continued through the seventh day but had disappeared by the tenth day except for a slight rhinorrhea. The first culture was not made until the fifth day; consequently the initial decrease in organisms does not show. This culture showed a heavy growth of *Staphylococcus albus* and other mouth organisms and a few colonies of hemolytic *Staphylococcus aureus* and *Haemophilus influenzae*. On the seventh day, when the cold was still active, the

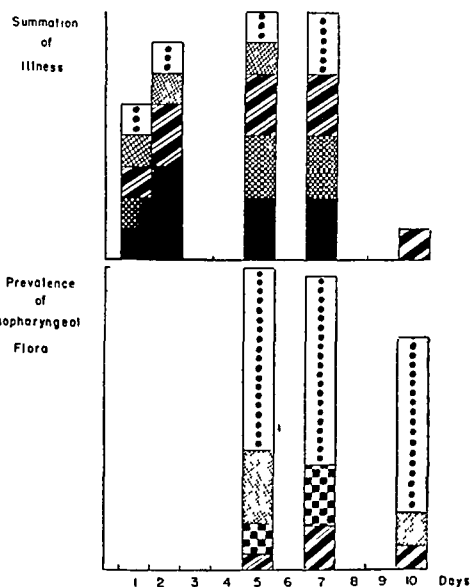


Fig. 3 (M. H.).—Control patient treated with milk sugar tablets. No change in pharyngeal flora; symptoms followed usual course.

culture continued to show a heavy growth with an increase in the number of colonies of *Staphylococcus aureus* and *H. influenzae*. On the tenth day, when the symptoms had subsided, the total number of organisms as well as the number of pathogens in the nasopharynx were decreasing.

TREATMENT WITH SULFADIAZINE

In the cases treated with sulfadiazine the most striking effect was the uniform reduction in the number and variety of organisms in the nasopharynx as measured by the serial nasopharyngeal cultures. Thirty-eight of the 48 cases studied showed a moderate or pronounced reduction in the total colony count. In some of these the effect was striking, showing on the plates a change from a heavy growth to a few scattered colonies. The total number of pathogens was also consistently reduced, but this seemed generally to be in proportion to the total reduction of organisms. Usually the pneumococcus, beta hemolytic streptococcus or other pathogen would not entirely disappear but would continue to show a few colonies and then return in larger numbers when the sulfadiazine was discontinued. The rapid return was pronounced in 6 of the 48 cases. In 10 instances no reduction in organisms was measured, but 5 of these showed a scant growth and no pathogens at the start, and the flora was held in check at that level.

The prevailing significant secondary organisms encountered in these cases were the pneumococcus in 20 patients, *Haemophilus influenzae* in 13, beta hemolytic streptococcus in 7 and hemolytic *Staphylococcus aureus* in 4. Nine persons in this entire group harbored no recognizable pathogens. In a number of instances more than one of these organisms were isolated. The pneumococcus types encountered were type 3 four times, type 6 three times, type 8 twice, type 18 three times, type 15 twice and types 4, 7, 11, 19, 20, 21 and 29 each once.

The clinical findings were not convincing. The average duration of the sulfadiazine treated cold was 8.1 days and that of the control 9.7 days. It can be appreciated that in a condition such as the common cold these figures are not significant. Of the 48 colds treated, 32 showed no recognizable secondary infection though they occurred in persons who usually suffered from complicated colds. Six persons developed sinusitis, bronchitis or both after the sulfadiazine treatment had been concluded. Five of the 6 had mild infections, but in 1 there was a moderately severe sinusitis and bronchitis (fig. 8), which lasted several days. Five patients had mild sinus and/or bronchial symptoms which developed during sulfonamide therapy. Five patients had irregular courses which could not be satisfactorily appraised. The patients were asked for their own opinions, and 34 expressed satisfaction with the therapy. Nine stated that they noticed no difference from previous colds, 1 was worse and 4 had no opinion

to offer. These personal opinions were interesting, but we know how misleading such information can be.

Figures 5, 6, 7 and 8 show the course of symptoms and changes in nasopharyngeal flora following sulfadiazine 1 Gm. three times daily for four days. The cases that are included represent the various types of response observed in the study. In the first case (fig. 5, G. F.) the onset was with a slight soreness of the throat, malaise and moderate rhinorrhea and sinus congestion. On the fourth day of the cold, when sulfadiazine therapy was started, in addition to the symptoms of onset there was also a moderate cough, and the nasopharyngeal culture showed a heavy growth which was almost pure hemolytic *Staphylococcus aureus*. Two days later (sixth day) the cold was much improved clinically but the nasopharyngeal culture still showed many colonies of hemolytic *Staphylococcus aureus* even though the blood sulfadiazine was 9.5 mg. per hundred cubic centimeters. Following this the symptoms disappeared almost completely; the nasopharyngeal culture showed a decided reduction in total organisms and almost complete disappearance of the hemolytic *Staphylococcus aureus*. This is the type of response that occurred in most of our cases.

Figure 6 (J. L.) shows a case that was not studied and treated until the tenth day of illness, when a very severe malaise, sore throat, rhinorrhea, sinus congestion and a moderate cough were present. The culture showed a heavy growth with many colonies of *H. influenzae* and a few colonies of hemolytic *Staphylococcus aureus*. The cold had progressed to the stage of second-

Fig. 4.—Key of symbols for symptoms and nasopharyngeal flora.

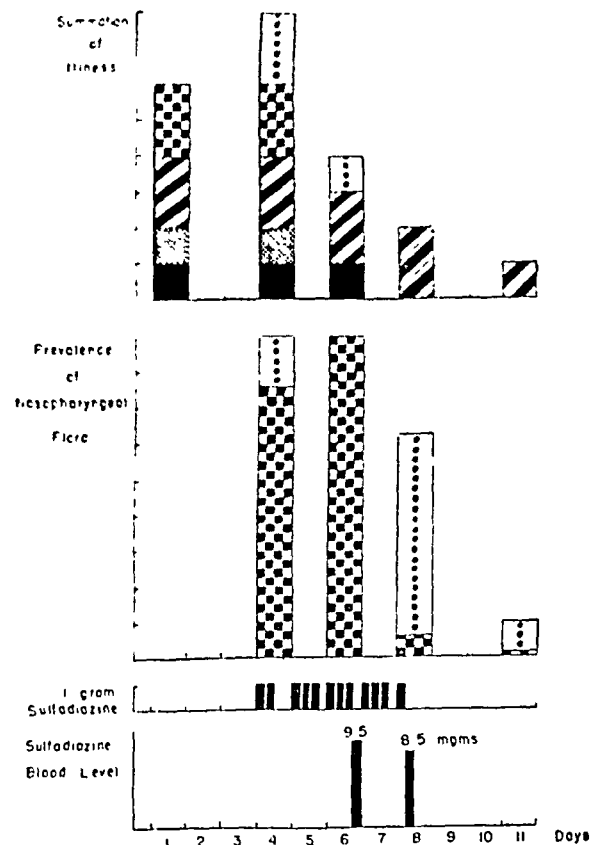
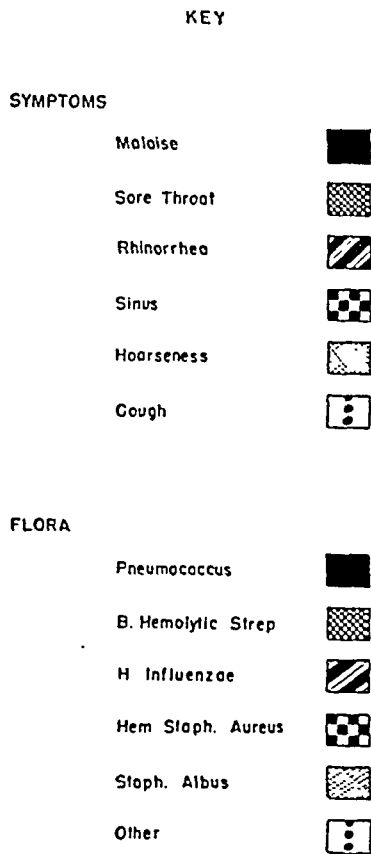


Fig. 5 (G. F.).—This patient shows a favorable clinical and bacteriologic response to sulfadiazine treatment.

dary infection. Following the institution of sulfadiazine therapy the symptoms subsided and the nasopharyngeal culture cleared rapidly.

Figure 7 (B. P.) again shows the course in a person treated by sulfadiazine 1.0 Gm. three times daily for four days. The onset this time was a slight sore throat

followed by severe rhinorrhea, moderate malaise and sinus symptoms. Treatment was instituted on the first day. The symptoms remained about the same for three days and then subsided slowly, disappearing except for a slight rhinorrhea on the seventh day. The

COMMENT

This study affords evidence that the sulfonamides do not shorten or alter the course of the uncomplicated cold. Furthermore, no striking benefits from sulfadiazine therapy were observed in the complicated colds. There is evidence, however, largely from the bacteriologic findings, that in selected cases secondary infections may be prevented by the oral use of sulfadiazine.

Our bacteriologic study revealed a consistent reduction in total organisms and number of pathogens cultured from the mucous membrane of the upper respiratory tract both in healthy persons and during colds following 1.0 Gm. of sulfadiazine three times daily. Cultures were made from the nasopharynx, which has the advantage of being relatively free from nasal and mouth contaminants, but what is true for the nasopharynx must be true also for other parts of the upper respiratory tract such as the trachea and sinuses. Bordley and his collaborators⁸ have reported similar bacteriologic findings following the local use of sulfadiazine, but their records indicate that satisfactory results are obtained only when the application is frequent enough to give an appreciable absorption. It would appear from our studies that the oral use of sulfadiazine is more dependable and simpler to administer than local application of the drug. Furthermore, the oral method is probably no more hazardous.

A very important factor in determining the value of sulfonamides in this field of therapy is the toxicity of the drug used. Sulfadiazine in the low dosage used in this experiment gives a satisfactory blood concentration but shows little clinical toxicity. The blood levels of sulfadiazine following the 3.0 Gm. daily dosage

varied from 3.4 to 10.5 mg. per hundred cubic centimeters with an average of 6.9 per cent. No serious toxic reactions occurred during the study. There was no nausea or vomiting, but there were two mild renal reactions, one with slight flank pain and many crystals in the urine, and the other with mild pain in the lower part of the abdomen radiating to the scrotum, with a few red blood cells in the urine. One other patient showed a sudden drop in the white blood cells at the time the sulfadiazine therapy was completed, but a few days later

the blood count was normal. The evidence from this study and other studies¹⁵ is that toxic reactions on this dosage of sulfadiazine are rare but that

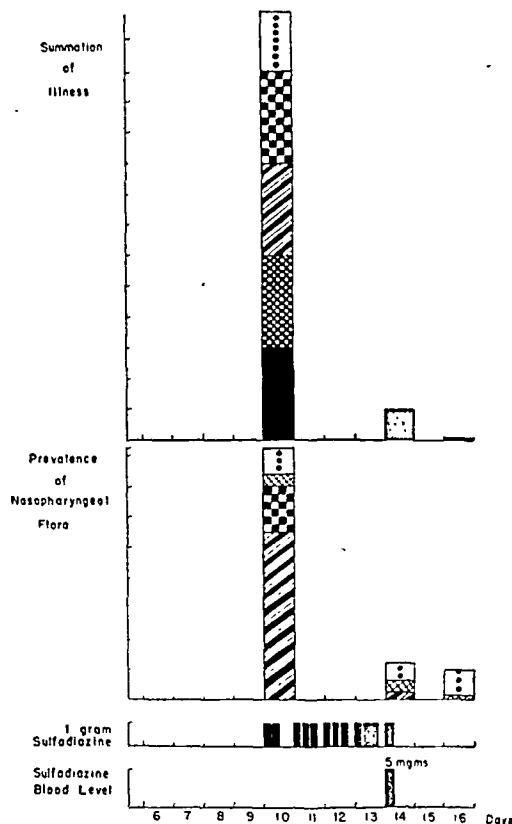


Fig. 6 (J. L.).—Patient was treated late in his infection with sulfadiazine. Excellent clinical and bacteriologic response.

nasopharyngeal culture at the time therapy was instituted showed a few pneumococci and a very few colonies of *H. influenzae*; these disappeared after treatment was started and the total number of organisms was considerably decreased. When treatment was discontinued the number of organisms increased and a few pneumococci were again found, although there was no return of symptoms. This person ordinarily has a long course of sinusitis following a cold (two to four weeks).

Figure 8 (S. M.) is the graph of a case of acute coryza which started with an irritated throat followed by malaise, rhinorrhea and sinus congestion. Treatment was started on the second day, when the rhinorrhea was severe and there was also an irritative cough. The nasopharyngeal culture on this day showed a heavy growth with a few colonies each of beta hemolytic streptococcus, *H. influenzae* and hemolytic *Staphylococcus aureus*. With the four days of treatment the course was somewhat favorable, the nasopharyngeal culture showing only a few organisms, the hemolytic streptococcus and *H. influenzae* disappearing entirely, and the symptoms being slightly less in evidence. With cessation of sulfadiazine treatment, however, the hemolytic streptococcus returned and type 20 pneumococcus appeared in increasing numbers. At the same time the symptoms became aggravated and the patient developed a severe sinusitis and bronchitis. The suggestion in this case is that if therapy had been continued for a longer period the secondary infection would have been prevented.

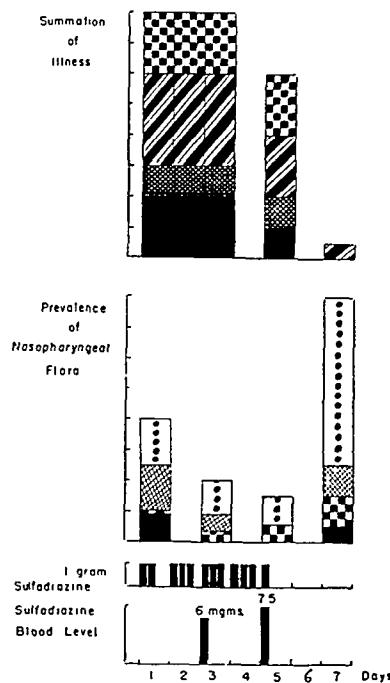


Fig. 7 (B. P.).—This patient shows excellent clinical and bacteriologic response to sulfadiazine but rapid reappearance of bacteria after discontinuance of the drug.

15. Plummer, Norman, and Wheeler, Charles: The Toxicity of Sulfadiazine: Observations on 1,357 Cases, *Am. J. M. Sc.*, to be published.

they can occur and must be guarded against. There is also the possibility of minor chronic pathologic changes¹⁶ occurring with sulfonamide therapy that may become significant following repeated courses of treatment. Finally there is the possibility of creating sulfonamide resistant organisms,¹⁷ a condition which up to the present has had only a slight clinical significance in respiratory infections but which might be highly important if the sulfonamides are used in frequent short courses.

During the past few years a number of reports on acquired hypersensitivity to sulfonamide drugs have appeared in medical literature. The most recent and comprehensive of these reports is that of Longcope.¹⁸ It would appear quite well established that a few individuals acquire hypersensitivity to sulfonamide drugs and show their reaction by fever, skin rashes, nausea and vomiting and other manifestations. The occasional occurrence of this phenomenon presents another reason

there are the cases of asthmatic bronchitis, pneumonia secondary to bronchiectasis, repeated otitis media or recurrent severe sinusitis in which sulfonamide drugs under similar control should be thoroughly tested.

SUMMARY

1. Seventy-two colds in 66 different persons were followed clinically and bacteriologically; 48 received sulfadiazine 3.0 Gm. daily by mouth for four days, while 24 served as controls.

2. Following sulfadiazine, the nasopharyngeal flora as observed by serial cultures showed a uniform decrease in total number of organisms and a check in the growth of pathogens.

3. The clinical course of the treated colds showed no striking difference from that of the controls; however, there appeared to be some amelioration of symptoms due to control of secondary bacterial infection.

4. As a result of this study, we are opposed to the routine use of sulfonamides in the treatment of the common cold but would favor their use in a few selected cases as a protection against severe secondary infection.

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FEVER THERAPY IN OPHTHALMOLOGY

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One of the more recent developments in ophthalmic therapeutics has been the use of fever therapy for acute lesions of the eye and its adnexa. The pyrexia has been produced by three methods, the parenteral injection of nonspecific proteins, the use of malaria and physical means. There are many reports in the literature of the use of fever therapy in ophthalmology. It seems worth while to review the subject in an attempt to evaluate the various methods and to determine the safest and most efficacious one. It would appear that several of the methods have a more or less specific place in the ophthalmologist's armamentarium.

The use of fever therapy, according to Gifford,¹ began with observation of the beneficial effect of intermittent infection with accompanying fever in various diseases. Only recently Reginis² and Delanoe and Sedan³ observed definite improvement in trachoma following pneumonia, typhoid and malaria. Cases have also been observed in which the use of diphtheria antitoxin produced an apparently beneficial effect in diseases other than diphtheria. Such observations in the past formed the basis on which fever therapy developed.

The mechanism of the beneficial effect of this therapy has been described recently by Sanders.⁴ He pointed out that in fever therapy a prompt effect is exercised on the autonomic nervous system; in the splanchnic area a vascular dilatation takes place, with contraction of the peripheral vessels causing a chill. This is soon followed by a capillary dilatation. With the rise of temperature there seems to be a general stimulation of cellular activity as shown by the changes in the blood. There is a short period of leukopenia followed

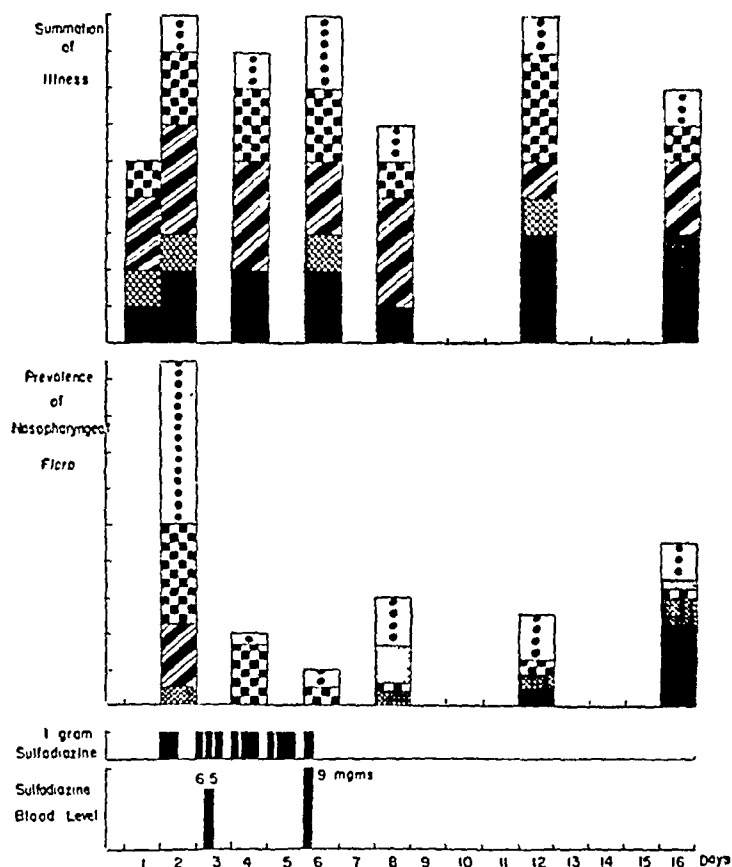


Fig. 8 (S. M.).—Acute coryza and sinusitis. Patient showed good bacteriologic response to sulfadiazine with only slight clinical improvement. With discontinuance of drug, pathogens again became numerous in the nasopharyngeal cultures, and patient developed a severe sinusitis and bronchitis.

why sulfonamide drugs should not be used as a routine in the common cold.

This report is only a preliminary one, but we present it chiefly because we believe that it offers a method for further study of the sulfonamides. On the basis of our experience we would restrict the use of the sulfonamides to a very few selected cases, such as those in which the history reveals an almost invariable and severe secondary infection following the cold. For example,

16. Merkel, W. C., and Crawford, R. C.: Pathologic Lesions Produced by Sulfathiazole: Report of Four Fatal Cases, *J. A. M. A.* **119**: 770 (July 4) 1942. Maisel, Bernard; McSwain, Barton, and Glenn, Frank: Effects of Administration of Sodium Sulfadiazine to Dogs, *Arch. Surg.* **46**: 326 (March) 1943.

17. Tillett, W. S.; Cambier, M. J., and Harris, W. H., Jr.: Sulfonamide-Fast Pneumococci: Clinical Report of Two Cases of Pneumonia Together with Experimental Studies on Effectiveness of Penicillin and Tyrothricin Against Sulfonamide Resistant Strains, *J. Clin. Investigation* **22**: 249 (March) 1943.

18. Longcope, W. T.: Serum Sickness and Analogous Reactions from Certain Drugs, Particularly the Sulfonamides, *Medicine* **22**: 251 (Sept.) 1943.

Paper published under the auspices of the Section on Ophthalmology. From the Division of Ophthalmology, University of California Medical School.

1. Gifford, S. R.: *A Handbook of Ocular Therapeutics*, ec. 3, Philadelphia, Lea and Febiger, 1942, p. 140.

2. Reginis, Maria: The Effect of Febrile Disorders on Trachomatous Complications, *Klinika Oczna*, **14**: 688, 1936; *abstr. Am. J. Ophth.* **20**: 439 (April) 1937.

3. Delanoe and Sedan, Jean: Pyrexias and Trachoma, *Rev. internat. du trachome* **15**: 1 (Jan.) 1938.

4. Sanders, Theodore E.: Nonspecific Protein Therapy in Ocular Disease, *J. Iowa M. Soc.* **31**: 51 (Feb.) 1941.

by leukocytosis, with the white cell count from 12,000 to 15,000, in which polymorphonuclear cells predominate. There is definitely a rise of antibody content of the blood, from either increased formation or increased circulation of antibodies from the tissues. Peterson⁵ was able to demonstrate that there is an increase in the blood content of proteolytic and lipolytic enzymes that break up the bacteria and their toxins into harmless products. This is accompanied by an increased cell permeability by which antibodies more readily penetrate the cells from the blood stream. Von Szily⁶ found that one of the local reactions of the eye consists of an active hyperemia of the whole uveal tract accompanied by infiltration with lymphocytes. Brown⁷ was able to show that the antibody content of the aqueous is increased. It seems probable according to Duke-Elder⁸ that the main effect is a general one whereby the whole mechanism of immunity receives a stimulation that produces greater activity.

The role of the fever is still doubtful; it may be only an unimportant manifestation of the reaction or it may be the cause of the increase in cellular activity. The vasodilatation may also play an important part. According to Duggan⁹ the effect of the bacteria and their toxins as well as the effect of other stimuli is the production of local ischemia with resultant pathologic changes. This newer conception of pathologic physiology is based on the work of Ricker,¹⁰ who stated the belief that the underlying mechanism of both inflammatory conditions and hypertension is a neurovascular upset. In inflammatory conditions bacteria or other stimuli at first set up a vasoconstriction of all terminal vascular segments. The capillaries rapidly become fatigued and relax, producing a fatigue paresis. Thus a dilatation of the capillaries is present, associated with a sustained constriction of the arterioles, which results in a slowing of the blood stream in the capillary bed. With this dilatation the capillaries become more permeable, possibly owing to anoxemia or to opening up of stroma between the capillary endothelial cells. Thus it is apparent that, depending on the degree of slowing of the blood stream and therefore of capillary dilatation, there will be progressive degrees of exudate. In the milder cases this will consist only of plasma and fibrin, in the less mild it will contain white cells and in the severe cases it will contain red cells. There are many causes for the vasospasm, among them the toxin of bacteria. On this basis, increasing the oxygen available to the area by relief of vasospasm seems rational. Gifford and Marquardt¹¹ and others have called attention to the fact that typhoid vaccine therapy acts as a vasodilator. This explains the beneficial effect of vasodilators, such as sodium nitrite, when combined with typhoid vaccine in the treatment of an acute fundus lesion that appears to have an angiospastic basis. Thus it seems feasible to assume that, in addition to the changes caused in the blood picture, the vasodilator factor in fever therapy may be important.

Both Gifford¹ and Sanders⁴ have pointed out that because the fever is the most obvious and easily recorded manifestation it is the best criterion as to the severity of the reaction. While therapeutic results are usually in direct relation to the degree of reaction obtained, one must remember that at times there seems to be a beneficial effect without the production of appreciable fever.

Having discussed the changes that take place in the body during fever therapy, I shall consider the various forms of fever treatment used.

PARENTERAL INJECTION OF FOREIGN PROTEINS

Although foreign protein therapy has lost some of its former popularity, particularly since the advent of the sulfonamide drugs, it is still used for such conditions as typhoid, pneumonia, puerperal sepsis, arthritis, pelvic inflammation, syphilis of the central nervous system, other diseases of the central nervous system (such as multiple sclerosis), peptic ulcer, certain infections of the skin and some vascular conditions (such as thromboangiitis obliterans⁴).

Foreign protein therapy has been found useful in the treatment of many ophthalmic diseases, including acute conjunctivitis, gonorrheal ophthalmia, phlyctenular keratitis, interstitial keratitis, corneal abscess, corneal ulcer, acute iritis, chronic iritis, uveitis, post-operative iridocyclitis, disease resulting from a wound of the eyeball, scleritis and sympathetic ophthalmia. It has also been advocated for retinitis, choroiditis, optic neuritis and retrobulbar neuritis. Slavik¹² reported some improvement in retinitis pigmentosa after milk and typhoid therapy, while Kapuscinski¹³ produced good results in herpes zoster and juvenile recurrent hemorrhage of the vitreous. Delanoë and Sedan³ reported significant improvement in acute trachoma. Foreign protein should be given early in the disease, before permanent damage has been done to the tissues involved. There can be little doubt that foreign protein therapy is of greater value for inflammation in the uveal tract, particularly the anterior part, than in any other tissue of the body.

The ideal reaction according to Lewis¹⁴ consists of a moderate chill with a temperature of about 103 F., which falls quickly and after twenty-four hours returns to normal. If it is desirable to continue the treatment another injection should not be given until the temperature returns to normal or its previous level. It is advisable to wait twenty-four hours at least, as not infrequently there is a secondary rise of temperature after twelve hours. Lewis said that the second dose should be given forty-eight hours after the initial dose and that too short an interval caused the death of 1 of his patients rather than large doses (50 million and then 100 million organisms). The output of urine should be checked after the injection. Hench¹⁵ recommended that no food be taken two to four hours prior to the injection.

Severe reactions are rare but do occur. The size of the dose is not the only factor in their production, as they have been known to follow even very small doses.

Treatment of severe reactions has been discussed a number of times. Cold sponging and packing in iced

5. Peterson, W. F.: Protein Therapy and Nonspecific Resistance. New York, Macmillan Company, 1922.

6. von Szily, A.: Experimental Investigation on the Effect of Foreign Protein Therapy in the Eye, *Ztschr. f. Augenh.* 71: 196, 1930.

7. Brown, A. L.: Experimental Uveitis, *Tr. Am. Ophth. Soc.* 33: 435, 1935.

8. Duke-Elder, W. S.: Text-Book of Ophthalmology. St. Louis, C. V. Mosby Company, 1941, vol. 3, p. 2215.

9. Duggan, W. F.: Choroiditis Centralis Serosa: Diagnosis, Pathologic Physiology and Therapy, *Arch. Ophth.* 27: 123 (Jan.) 1942.

10. Ricker, C.: Sklerose und Hypertonie der innervierten Arterien, Berlin, Julius Springer, 1927; cited by Tucke, F. T., and Nicholls, J. V., *J. Am. J. Ophth.* 21: 395 (April) 1936.

11. Gifford, S. R., and Marquardt, G.: Central Angiospastic Retinopathy, *Arch. Ophth.* 21: 211 (Feb.) 1939.

12. Slavik, B.: Stimulating Therapy in Pigmentary Degeneration of the Retina, *Ceskoslov. Ophth.* 3: 1, 1937; abstr., *Am. J. Ophth.* 20: 1172 (Nov.) 1937.

13. Kapuscinski, W. J.: Typhoid Vaccine in Ocular Therapeutics, *Bull. Soc. franc. d'ophth.* 51: 277, 1938.

14. Lewis, E. M.: Dangers from Nonspecific Protein Therapy, *South. M. J.* 34: 51 (June) 1941.

15. Hench, P. S.: Usual and Unusual Reaction to Protein (Fever) Therapy, *Arch. Int. Med.* 49: 1 (Jan.) 1932.

sheets is indicated. For anaphylactoid phenomena Hanzlik and Karsner¹⁶ recommended the intravenous use of atropine and epinephrine. Howard¹⁷ advised large doses of digitalis by hypodermic when a severe reaction occurs with signs of circulatory collapse. Hench¹⁵ said that renal insufficiency and oliguria demand the administration of diuretics intravenously.

Foreign protein therapy is not without risk. There are definite contraindications to its use. Cecil¹⁸ listed the more important ones: advanced arterial, renal or cardiac disease; allergic states or conditions of pronounced protein sensitivity, such as angioneurotic edema and giant urticaria; states of extreme exhaustion following prolonged illness; pulmonary tuberculosis, active or quiescent; hemorrhagic conditions, such as hemophilia and bleeding ulcers; chronic alcoholism, in which it may produce delirium tremens, and severe nervous sensibility, such as that seen in hyperthyroidism. Hench¹⁵ added chronic infections of long duration with dissemination to several sites; the period within fourteen days after an operation, for hemorrhage has occurred occasionally when vaccine was given within ten days after tonsillectomy or a minor pelvic operation; pregnancy, for fear of inducing hemorrhage and uterine muscular contractions, and rheumatic fever with acute or decompensated carditis and diabetic acidosis. Raulston¹⁹ stated that foreign protein therapy in the aged usually does not produce very favorable results.

In discussion of the various substances used to cause the reaction, the classification of Sanders¹ will be followed.

Native Proteins.—The successful and widespread use of foreign protein therapy in ophthalmology dates back to 1915, when it occurred to Schmidt²⁰ of Prague to use cow's milk to induce fever. There are earlier isolated instances of the use of foreign protein in the treatment of certain conditions, but Schmidt's work started this type of therapy in ophthalmology. His work was quickly followed by that of Saxl,²¹ Muller and Thanner,²² Purtscher²³ and many others. For a number of years this form of therapy was widely used. According to Muskat²⁴ its advantage is that milk is a universal product and constant in its chemical composition. He stated the belief that the good reaction was due to its complexity and the variety of enzymes in its cleavage products.

The usual method is to inject intramuscularly 8 to 12 cc. of fresh cow's milk (for patients of average weight) that has been sterilized by being boiled four minutes and has then been cooled. This period of boiling was chosen as being long enough to destroy bacterial contamination and yet not long enough to inactivate whatever might be the active component contained in milk. (In infants, for example in the treat-

ment of ophthalmia neonatorum, 1 to 2 cc. is sufficient to produce a temperature of 100 to 103 F.) In most instances the injection is followed by a rise of body temperature, with chill and malaise, which usually subsides within eight hours. The temperature may rise to 100 to 103 F. or, in some instances, the injection may produce no reaction even though given in a similar manner and in a comparable case. Barkan and Nelson²⁵ were able to show that the shock-producing properties of milk depend in a large part on the bacterial count of the milk. El-Bakly²⁶ stated that the poorer grades of milk give better results because of the higher bacterial count. In the use of milk injections at the University of California, a reaction was not produced until milk was obtained from the corner grocer and incubated for twelve to twenty-four hours before injection. The hospital was supplied with certified milk, which has a low bacterial count (less than 10,000 per cubic centimeter).

While the literature contains many reports of successful reactions with milk, there were many failures because of this factor. In addition, the milk had to be boiled and cooled, which was an inconvenience. Hematoma and local abscesses were not infrequent. Because of the unreliability of the reactions observed in this country and because of the complications mentioned, milk injections were not used as long or as extensively here as abroad. In discussing this subject with Pillat in Vienna in 1935 he stated that milk injections were not feasible in America, as the milk was too clean. As a result of these disadvantages other methods have in general come to replace the use of milk to induce fever in adults.

That milk was not entirely satisfactory is evidenced by the fact that many substitutes for milk were put on the market.

The caseins received a good deal of attention for a time. Wick²⁷ used yatren-casein, caseosan, alobintin, perprotasin and aolan and found that, while they were useful in treating acute ocular conditions, they were not as effective as milk. Triebenstein²⁸ also reported beneficial results with yatren-casein in some of the chronic inflammations of the eye but found milk injections were more effective. Gaston²⁹ found aolan much less effective than milk, while Jickeli³⁰ obtained good results from aolan. While there are numerous reports of the use of these caseins, they are as a rule not very encouraging.

Egg albumin was also used. The report of Frydman³¹ is typical. He used cibalbumin, which contains 1 per cent egg albumin, and expressed the opinion that it produced mildly satisfactory results. He concluded that protein therapy by intramuscular injection of cibalbumin presents no danger to the general organism or the eye and that it was easily applicable to ambulatory patients.

Haass³² pointed out that von Szily⁶ demonstrated histologically that parenteral injection of nonspecific

16. Hanzlik, P. J., and Karsner, H. T.: Anaphylactoid Phenomena from Intravenous Administration of Various Colloids, Arsenicals and Other Agents, *J. Pharmacol. & Exper. Therap.* **14**: 379 (Jan.) 1920; A Comparison of the Prophylactic Effect of Atropine and Epinephrine in Anaphylactoid Shock and Anaphylactoid Phenomena from Various Colloids and Arsenamine, *ibid.* **14**: 425 (Jan.) 1920.

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23. Purtscher, O.: Milk Injections in Eye Disease, *Ztschr. f. Augenh.* **43**: 100 (Jan.) 1920.

24. Muskat, I. I.: Milk Injections in Gonorrheal Ophthalmia, *Am. J. Ophth.* **2**: 539 (July) 1928.

25. Barkan, Otto, and Nelson, R. F.: The Active Agent in Milk Injection, *Tr. Sect., Ophth. A. M. A.*, 1923, p. 131.

26. El-Bakly, M. A.: Milk Injections, *Bull. Ophth. Soc. Egypt* **26**: 179, 1933.

27. Wick, W.: Protein Therapy in Ophthalmology, *Arch. Ophth.* **118**: 221, 1927.

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30. Jickeli, Carl: Further Experiences with Nonspecific Intracutaneous Aolan Therapy in Ocular Diseases, *Klin. Monatsbl. f. Augenh.* **80**: 221 (Feb.) 1928.

31. Frydman, R.: Protein Therapy in Ophthalmology, *Rev. gén. d'ophth.* **42**: 85 (March) 1928.

32. Haass, F.: Remarks on Nonspecific Therapy, Especially with Protasin and Perprotasin, *Ztschr. f. Augenh.* **73**: 50 (Dec.) 1930.

protein results in an inflammatory reaction in the eye followed by a phase in which inflammation is retarded. He said that it would be desirable to find agents which would directly produce the second, or anti-inflammatory, stage, and he found protasin and perprotasin to be such agents.

Protein Split Products.—Protein split products, including peptone albumose and the proteoses, have all had their advocates but have never been used extensively. Nolf³³ injected 5.6 cc. of a 10 to 100 peptone solution into the vein and repeated the injection every hour. He obtained beneficial results in ocular complications occurring during typhoid, typhus and septicemia. Narog³⁴ found pepsin injected subconjunctivally useful in the treatment of trachomatous lesions of the eyelids and turbidity of the vitreous.

Tissue Extract.—Rinaldi,³⁵ injecting bovine uveal pigment in 10 cases of sympathetic ophthalmia, found slightly increased sensitivity. He said this treatment was distinctly beneficial but that the action was not like that of foreign protein, for it was only when all general and local reactions were avoided that the decided improvement resulted.

Serums.—As Clegg³⁶ has pointed out, various types of serum have been employed in the treatment of ocular lesions. They include the serums of Roux and Behring, Deutschman's yeast serum, auto serum, normal horse serum and antitoxin. Only the more frequently used ones will be discussed here.

As early as 1904 Darier,³⁷ noting the excellent results of diphtheria antitoxin, experimented with it in the treatment of conditions other than diphtheria. At about the same time Rohmer³⁸ used autoserum obtained by raising a blister in the scapular region, drawing off the serum and injecting it under the skin or subconjunctivally. Another method employed is to withdraw 5 to 10 cc. of blood from the patient's vein and either inject the whole blood intramuscularly immediately or allow the clot to separate and then inject the serum. The results have been claimed to be superior to those of other methods. Jacovides³⁹ used autoserum in 150 cases of corneal ulcer, with good results in 140. Wick²⁷ and others, in comparing the effects of autoserum with those of other proteins, found the results to be no different except that fever occurred less often with autoserum. Mata⁴⁰ reported 11 cases of tuberculous iridocyclitis in which he withdrew the aqueous and injected blood into the anterior chamber. He found that with this method the condition cleared more rapidly than in control eyes. As Gifford¹ pointed out, there seems to be no reason for ascribing to autoserum the remarkable advantages claimed by some authors, while the conditions of administering it make it much less convenient than milk or typhoid vaccine.

Antidiphtheria Serum: The use of antidiphtheria serum has been advocated by a number of authors.

Key⁴¹ used 2,400 to 3,200 units every two to three days in the treatment of corneal disease, including hypopyon keratitis and serpiginous ulcer, of infection of the anterior segment of the eye and of panophthalmitis. Verhoeff⁴² reported some remarkable results in the treatment of sympathetic ophthalmia. According to the age of the patient, he used from 5,000 to 20,000 units daily for a week, eliminated the treatment the following week and then repeated it for two to three weeks.

Horse Serum: Scarlett⁴³ stated the belief that in diphtheria antitoxin it was the horse serum rather than the antitoxin that was the effective element. He used pure horse serum in the treatment of acute iritis and concluded that of the foreign proteins it gave the most definite reaction and also the greatest relief from symptoms.

The disadvantages of using pure horse serum or antitoxins are obvious. An intradermal test must be made for sensitivity to avoid the occurrence of dangerous or fatal anaphylactic shock. The test apparently is not infallible, as Liebman⁴⁴ reported anaphylactic shock following the use of antidiphtheria serum in a patient who had a negative intradermal reaction before injection of the serum. Most authorities agree that horse serum has the objection of sensitizing the subject and producing serum reactions. With repeated doses the non-specific reactions may become more severe, even when the injections are made within the period usually allotted before sensitization will occur. Great caution should be exercised in its use, especially since there is no conclusive evidence that the temporary effects obtained are worth the dangers risked by its injection. The one disease for which its use may be justified is sympathetic ophthalmia, in which diphtheria antitoxin apparently is useful.

Vaccine.—While various vaccines have been employed, the use of typhoid vaccine intravenously is the method most widely advocated for fever therapy. The indications for its use are those given for other types of foreign protein fever therapy.

Typhoid vaccine was first used intravenously by Kraus and Mazza⁴⁵ in Argentina about 1912. It was first given intravenously as a nonspecific protein for fever therapy by Miller and Lusk⁴⁶ in the treatment of chronic infectious arthritis. It is employed for many diseases, particularly of the joints, skin and eyes. This discussion will be limited to its use in ophthalmology.

The preparation usually employed is the standard typhoid-paratyphoid A and B vaccine. The injection is given intravenously, and the dose varies from 5 million to 100 million organisms, depending on the individual ophthalmologist. Thirty million is the amount usually recommended as the initial dose. Sanders⁴ recommended 50 million as the initial dose for men and 35 million for women. This is increased to 40 and then to 50, 60, 70 or 100 million, depending on the preceding reaction. The usual reaction consists of a chill, fever, mild headache, general malaise and mild gastrointestinal

33. Nolf, P.: Intravenous Injections of Peptone, *Clin. Ophth.* **23**: 217, 1919.

34. Narog, F.: Experimental and Curative Applications of Pepsin in Eye Diseases, *Am. J. Ophth.* **9**: 746 (Oct.) 1926.

35. Rinaldi, S.: Clinical Research on the Antigenic Properties of Uveal Pigment, *Ann. di ottal. e clin. ocul.* **61**: 268 (April) 1933.

36. Clegg, J. Gray: Discussion of Etiology and Treatment of Hypopyon Ulcer, *Tr. Ophth. Soc. U. Kingdom* **47**: 24, 1923.

37. Darier, A.: Pros and Cons of Milk Injections, *Clin. Ophth.* **25**: 607, 1921.

38. Rohmer, A.: Autoserum Therapy in Ophthalmology, *Arch. d'ophth.* **33**: 257 (May) 1913.

39. Jacovides, A.: Auto Serum in Ocular Therapeutics, *Bull. Ophth. Soc. Egypt*, 1919, p. 80.

40. Mata, P.: Experiences in Autohemotherapy in the Anterior Chamber in Tuberculous Iridocyclitis, *Arch. d'optal. hispano* **35**: 270 (May) 1935.

41. Key, Ben Witt: Further Observations of Protein Injections in Severe Ocular Infection, *Arch. Ophth.* **51**: 471, 1922; Influence of Protein Therapy on Experimental Staphylococcal Infection of a Rabbit's Cornea, *Am. J. Ophth.* **9**: 351 (May) 1926.

42. Verhoeff, F. H.: An Effective Treatment for Sympathetic Uveitis, *Tr. Am. Ophth. Soc.* **24**: 173, 1926.

43. Scarlett, Hunter: Clinical and Experimental Observations on Foreign Protein Especially in Iritis, *Am. J. Ophth.* **10**: 747 (Oct.) 1927.

44. Liebman, William: Anaphylactic Shock from Use of Foreign Protein, *Am. J. Ophth.* **13**: 146 (Feb.) 1930.

45. Kraus, R., and Mazza, S.: Vaccine Therapy in Abdominal Typhoid, *Deutsche med. Wchnschr.* **2**: 1556, 1914.

46. Miller, J. L., and Lusk, F. B.: The Treatment of Arthritis by the Intravenous Injection of Foreign Protein, *J. A. M. A.* **66**: 1756 (June 3) 1916.

upset. The temperature varies a good deal with the individual patient and the vaccine used. Allen⁴⁷ found that the average temperature obtained after an average initial injection of 53 million organisms was 101.8 F. After the second injection, in which an average of 80 million organisms was used, the temperature averaged 102.7 F.

The use of typhoid vaccine is not entirely without danger, and, while they are rare, unusual reactions do occur. Hench¹⁵ reported 3 deaths among 2,500 patients given 10,000 injections at the Mayo Clinic. Sudden death has also been reported by Russel,⁴⁸ Lemoine,⁴⁹ Patton⁵⁰ and others.

A focal reaction, or activation of the local lesion, immediately after an injection of foreign protein is a well recognized phenomenon but is usually transitory. It has been reported in the treatment of diseases of the eye by Benedict,⁵¹ Tobias,⁵² Lockhart⁵³ and others, but it is so rare in such treatment that it may be disregarded. The contraindications to fever therapy in general, previously listed, also apply here.

After the death in San Francisco of 2 young and apparently healthy persons who had received typhoid vaccine for ocular diseases in 1935, my co-workers and I at the University of California Hospital modified our dosage. According to the age, size and general condition of the patient, it is our routine to start intravenous injections of typhoid vaccine with a dose of 5 to 7 million killed organisms. This produces a moderate rise of temperature in one to two hours lasting two to four hours and producing relatively little discomfort. The temperature at times goes up to 103 F. but usually averages about 101 to 102 F. The following day the dose is increased to 7½ to 9 million organisms unless there has been a secondary rise of temperature, in which case the second dose is delayed twenty-four hours. On the third day 9 to 10 million organisms are given and on the fourth 12 to 15 million. Thus it is possible to produce fever and prolonged vasodilatation over a period of four days without any great discomfort to the patient. In a few instances when the patient does not respond to these doses the amount is increased to 25 million. It must be remembered that there is considerable variation in the potency of commercial vaccines regardless of their reported bacterial count and that doses must be varied accordingly.

Having used the smaller doses since 1935, we have found that the average temperature after the first injection has been 101.5 F., after the second 102.1 F., after the third 101.8 F. and after the fourth 101.4 F. These figures are almost identical with the temperatures observed by Allen,⁴⁷ who after an average dose of 53 million organisms found an average temperature of 101.8 F. and after a second average injection of 80 million organisms an average temperature of 102.2 F. In general we feel that vasodilatation is probably an important part of the beneficial effect derived from fever therapy, except in the treatment of syphilitic patients, and it is our opinion that the smaller doses

of typhoid vaccine, which cause less severe systemic reactions, are as efficacious as the larger doses formerly employed and make prolonged vasodilatation possible. Hench¹⁵ also favored the smaller doses and said that, "although large doses may be tolerated, small doses if accompanied by an adequate reaction seem preferable, since as beneficial results seem to follow the use of small doses as the large doses."

The method of dosage is as follows: We have used Cutter Laboratories (Berkeley, Calif.) typhoid vaccine, which contains 500 million bacilli per cubic centimeter. With a tuberculin syringe 0.1 cc. of this solution is drawn up; it is then diluted to 1.0 cc. with isotonic solution of sodium chloride or distilled water. With this solution 0.1 cc. contains 5 million, 0.15 cc. 7½ million, 0.24 cc. 12 million, 0.30 cc. 15 million organisms, and so on.

In addition to the usual conditions treated by fever therapy, we have found typhoid vaccine therapy valuable in the treatment of acute fundus lesions when a rapid prolonged vasodilatation is desirable. It has also been used in the treatment of acute fundus disease by Gifford and Marquardt¹¹ and Benedict and Rucker.⁵⁴ It can be combined with the use of sodium nitrite or some other form of vasodilator.

Of the means of inducing fever, typhoid vaccine is the most useful and the most widely employed in ophthalmology because of the consistent reaction and ease of use. In spite of occasional untoward reactions, there are acute ocular lesions that demand the risk because of the probable benefit and the hope of preservation of vision in what might otherwise be a hopeless situation.

Typhoid H Antigen.—The antigen in washed flagellums of typhoid bacilli, known as typhoid H antigen, induces a less violent reaction than typhoid vaccine and has been advocated as a substitute. The antigen is prepared by adding 0.1 to 0.2 per cent solution of formaldehyde or 0.5 per cent phenol to a broth culture or a saline solution suspension of a motile strain of *Eberthella typhosa*. Its uses and dosage are for all practical purposes identical with those of typhoid-paratyphoid vaccine. The principal advantage of typhoid H antigen is that it produces a satisfactory rise of temperature without a great deal of chill. It has been said that the chill phase of nonspecific foreign protein therapy is conducive to thrombosis and that its elimination adds materially to the safety of the method. This antigen has never obtained widespread popularity.

According to Klauder and Robertson,⁵⁵ after an intravenous injection the constitutional reaction is not pronounced, so that ambulant patients may be treated. They employed the method in 30 children with active interstitial keratitis attending the Wills Hospital, Philadelphia, the youngest patient being 6 years of age. They found that the chill appeared one hour after the injection, lasting usually about half an hour, and the temperature rose to 102 to 104 F., becoming normal in six to eight hours. Patients in the hospital as well as those attending the clinic were treated. No serious untoward reactions were produced. They found that different lots of typhoid H antigen varied in their ability to produce reactions and different patients varied in the degree of their reactions from the same lot of

47. Allen, Thomas D.: Typhoid Vaccine in Ophthalmology, Tr. Sect. Ophth., A. M. A., 1925, p. 135.

48. Russel, J. L.: Report of Two Deaths from the Third Inoculation with Typhoid-Paratyphoid Vaccine, Kentucky M. J. 22:378 (Oct.) 1924.

49. Lemoine, A. N., in discussion on Allen.⁴⁷

50. Patton, J. M.: The Pros and Cons of Foreign Protein Injections in Affections of the Eye, J. Iowa M. Soc. 12:387 (Oct.) 1922.

51. Benedict, W.: Protein Therapy in Ophthalmology, Minnesota Med. 11:203 (April) 1928.

52. Tobias, G.: Focal Reaction in the Eye in Protein Therapy, Klin. Wchnschr. 1:55 (March 11) 1922.

53. Lockhart, R. J.: Coronary Thrombosis and Death After Typhoid-Paratyphoid Vaccine, Brit. J. Dermat. 51:318 (July) 1939.

54. Benedict, W. L., and Rucker, C. W.: Use of Foreign Proteins in the Treatment of Diseases of the Eye, New Orleans M. & S. J. 81:782 (May) 1929.

55. Klauder, J. V., and Robertson, H.: Fever Therapy in Interstitial Keratitis, Am. J. Ophth. 18:758 (Aug.) 1935.

vaccine. Sanders⁴ stated that it can be used in the office and that it causes prompt rise of temperature but usually without chill. Brown⁵⁶ used typhoid H antigen preoperatively in all cases of cataract to prevent inflammation. From fifty to seventy-two hours before operation the patient was given intradermally 1 minim (0.06 cc.) of a solution of typhoid H antigen (25 million organisms per cubic centimeter). If there was no local reaction within twenty to thirty minutes, a solution containing 15 million organisms was injected intravenously. This was done at the office and the patient instructed to go home because a reaction might ensue in four to eight hours.

When an eye was perforated accidentally in any manner, typhoid H antigen was immediately given intravenously after a negative cutaneous reaction. If the wound was purely ocular, preference was given to the antigen rather than to antitetanus serum unless there was definite reason to fear exposure to tetanus.

In our limited experience with typhoid H antigen we found that the action and reaction were much like those of typhoid vaccine.

Mason,⁵⁷ in an endeavor to obtain good results from foreign protein without shock, used an antigen which contained *Streptococcus haemolyticus* with *Staphylococcus aureus* and *Staphylococcus albus* and which had a very low protein content and was nontoxic. He used it in 8 cases of uveitis with excellent results. No patient showed shock or chill, and the temperatures did not register over 0.5 degree (F.) above normal. No further reports of this treatment have appeared.

Spirochetic vaccine of Hilgermann was used by Charamis⁵⁸ in the treatment of ocular syphilis. There were 3 patients with interstitial keratitis, 1 with oculomotor and facial nerve paralysis and 1 with choroiditis. Those with interstitial keratitis particularly were benefited. He said that vaccine therapy is valuable in slowly evolving cases and particularly as a complement to chemotherapy. Its use has been so limited that it does not require serious consideration.

Bacterial Extracts.—There are times when a milder fever therapy is desirable or when it is not practical to hospitalize the patient. Under these conditions Coley's mixed toxins⁵⁹ can be given in the clinic or office and the patient sent home. We have found this preparation to be a useful addition in fever therapy. Relatively little has been written regarding its use in ophthalmology aside from an article by Levine⁶⁰ in 1931. It is a mixture of toxins derived from killed cultures of *Staphylococcus erysipellatis* and *Bacillus prodigiosus*, which are grown separately, then mixed and finally diluted to a definite strength as determined by the percentage of proteins contained.

The adult dosage is 3 minims, with proportionately less for children. Deep intramuscular injections are given into the arm with the ordinary tuberculin syringe. Levine⁶⁰ found that in only 2 cases was it necessary to give 4 minims to obtain the desired reaction. The reaction sets in four to five hours after the injection, which allows the patient time to reach home before it starts. There is usually a chill that lasts fifteen to thirty minutes and is followed by a rise of temperature from 100 to 102 F. which may last ten or more hours.

There is no headache or vomiting and very little discomfort. It is important, as Lewis¹⁴ has pointed out, that the patient remain in bed until the reaction is entirely over. There may be some redness in the arm at the site of the injection, but it disappears quickly. Coley's mixed toxins have been found useful in the treatment of mild acute inflammation of the uveal tract, corneal ulcer and the milder postoperative iridocyclitis. It is well to remember this preparation as an inexpensive, easily administered means of fever therapy that can be used without hospitalization and produces a fair fever reaction.

Omnadin⁶¹ consists of a mixture of protein substances obtained from nonpathogenic bacteria, various animal fats and lipoids derived from bile. It is given in 2 cc. doses intramuscularly daily or at times twice a day. It causes no temperature reaction and therefore strictly speaking does not belong in a discussion of fever therapy. As Sanders⁴ has stated, it does, however, produce some leukocytosis and a rise in the antibody content of the blood. It causes no untoward reaction and has been found useful in those cases in which the physical condition does not warrant the severer types of foreign protein therapy, for example iridocyclitis following cataract extraction in older patients. Wick²⁷ found that, while it did not produce fever, as did milk, it did cause an improvement in the inflammatory process.

USE OF MALARIA

In 1918 Wagner-Jauregg⁶² introduced malaria as a treatment for dementia paralytica, and, because of the remarkable results obtained, its use in the treatment of syphilitic conditions became rather widespread. Heat is a spirocheticide. The virulence of *Treponema pallidum*, studied in rabbits, was reduced when subjected to a temperature of 104 F. The thermal death point is slightly higher. This fact had led to use of the higher temperatures in fever therapy of syphilitic conditions.

In malaria fever therapy, *Plasmodium vivax*, the parasite of the benign tertian type, is used. A complete physical examination is necessary before the treatment is started to rule out the contraindications to fever therapy. It is not to be used for patients under 11 years of age, as typhoid therapy is as effective in the younger age group and malaria therapy is not well tolerated by children. According to Klauder and Robertson⁶³ Negroes are usually immune, so that it cannot be used in that race. To induce the fever 5 to 10 cc. of blood from a patient with malaria is withdrawn and injected into the vein of the recipient. With the onset of the fever the blood pressure should be taken twice daily and the blood count twice a week. If the systolic blood pressure drops below 90 between paroxysms and if the red cell count is below 2,000,000, the patient's condition is considered serious. In uncomplicated cases eight to ten chills are permitted before the malaria is terminated by giving quinine sulfate 0.09 Gm. three times a day for five to seven days. The local treatment to the eye is given as usual. During the treatment the patient is put on a high caloric diet and fluids are forced. The urinary output is watched, as oliguria necessitates suspension of the treatment. With this form of fever therapy the temperature will rise to 105 or 106 F.

56. Brown, Albert C.: Use of Typhoid H Antigen Before Intra-Ocular Operations, *Arch. Ophthalm.* 19:181 (Feb.) 1938.

57. Mason, R. E.: Bacterial Antigen in Uveitis, *Am. J. Ophthalm.* 11:702 (Sept.) 1929.

58. Charamis, J. S.: Vaccine Therapy of Ocular Syphilis by the Spirochetic Vaccine of Hilgermann, *Arch. Ophthalm.* 3:779, 1939.

59. Prepared by Parke, Davis & Company.

60. Levine, J.: Nonspecific Protein Therapy—Advantages of Coley's Mixed Toxins, *Arch. Ophthalm.* 6:75 (July) 1931.

61. Prepared by Winthrop Chemical Company, Inc.
62. Wagner-Jauregg, Julius: The Influence of Malaria on General Paralysis, *Psychiat-neurol. Wechnschr.* 20:132 (Aug.) 1918-1919.

Ambler and Van Cleve⁶³ stated the belief that this treatment is beneficial in interstitial keratitis. Clark⁶⁴ concluded that the malaria treatment may arrest syphilitic invasion of the optic nerves and preserve vision. The McIntyres⁶⁵ said that syphilitic optic nerve atrophy should be treated with malaria. In their opinion malaria has several practical advantages over heat therapy. It is less expensive and requires less time, less equipment and less technical assistance. The number of patients treated is not limited by the units. In addition, the biologic antagonism of malaria to syphilis is of longer duration and biochemically more far reaching than that exerted by heat alone. There are many other favorable reports in the literature.

In spite of the favorable reports there are serious inherent faults. The induced infection may produce great damage. There are always pronounced fatigue and wasting away as a result of the treatment. The mortality in different series varies from 1 to 10 per cent. The fever-producing properties are not constant, and 10 per cent of the injections are unsuccessful. The difficulty of maintaining properly attenuated strains of the virus also must be considered. As Hambresin⁶⁶ stated, it must be remembered that a patient inoculated with malaria can infect anopheles that would transmit the malaria. Lastly, malaria treatment requires from two to four weeks of hospitalization. From this it is apparent why even for syphilitic conditions malaria treatment has been rather generally discarded in favor of other types of fever therapy.

PHYSICAL MEANS

Several physical methods have been used to produce fever therapy. They have the advantage that the fever can be controlled as to time, amount and duration.

High Frequency Methods.—According to Coulter⁶⁷ the production of heat in the body tissues with high frequency currents insufficient in amount to harm or destroy tissues is called medical diathermy. There are three different methods of application.

Diathermy: This is usually construed to mean the use of the ordinary diathermy machine, which operates on a frequency of about 1,000 kilocycles (300 meters). It is applied by ordinary metallic electrodes held in contact with the body by a jacket or binder. The patient is covered with blankets or encased in an insulating bag. Neymann and Osborne⁶⁸ found it possible to induce fever with diathermy. Neymann and Koenig⁶⁹ reported that diathermy-induced fever produced a higher rate of remission in patients with dementia paralytica than was obtained in a comparable series of patients treated with malaria or rat bite fever. Other writers have given equally encouraging reports. The indications for the use of diathermy in ophthalmology are by no means well established. It has been used to give relief from pain in herpes zoster and in the treatment of corneal ulcer and a few other conditions. According to Gifford⁷⁰ one condition in which it has

been successfully used is orbital cellulitis which does not localize well enough so that incision is effective. A large sheet of tin or aluminum is molded to cover the region, this being used as the active electrode. The larger the active electrode the less the heat that is generated at any one point; thus a large electrode eliminates heat that is "dangerous to the eye, provided that only 200 to 400 milliamperes be employed, and that the current be reduced whenever the heat becomes uncomfortable to the patient."

Radiothermy (Short Wave Therapy): The radiotherm is operated at about 10,000 kilocycles (30 meters) with tube oscillators. The patient is placed in a high frequency field between the two large plates of the radiotherm, without active contact, heat being produced by dielectric losses and induced currents. Bishop, Lehman and Warren⁷⁰ emphasized that in treating a patient by this method the moisture must be removed to prevent burns. They employed a cabinet in which lamps maintained the temperature after the current was turned off. With this apparatus, according to Hambresin,⁶⁶ one produces a temperature of 105 F. in a patient weighing 70 Kg. in half an hour. After this temperature is reached it is maintained for four hours. This treatment demands rigorous supervision by a nurse-technician during the application and the repose period that follows. According to Bierman⁷¹ there is evidence that short wave therapy does have some bacteriostatic effect in various tissue infections. In addition to elevation of the temperature the biologic reaction of tissues is important. This includes hyperemia, with its greater blood and lymph flow, together with changes in local metabolism and local immunity. One of the real dangers of this method of treatment is burns of the skin. Its use has been reported in the treatment of chronic uveitis, vascular fundus disease, acute progressive infection and syphilitic optic nerve atrophy, but observations of treatment of ocular disorders are rare. There is no record of damage to the eye from the local use of short wave therapy. Short wave is an effective agent for creating heat within the eye. The work done in this field is recent and the number of cases too few to permit a conclusive statement as to the value of short wave therapy.

Inductothermy: In this method of fever therapy an electromagnetic field is produced with the patient acting as resistance. Heat is therefore induced internally. The technic, according to Weeks and Morris,⁷² is simple. The patient can be treated in bed with a canvas support replacing the springs.

The induction cable is laid in a loop on the bed. Padding is placed between and around the loop to provide a level surface. The patient is placed in a water-proof canvas bag with a wood cradle inserted between patient and bag so as to permit a certain degree of mobility.

The pulse rate, respiratory rate and rectal temperature are recorded every five minutes.

In general, old age, organic lesions of the cardiovascular system, nephritis, anemia and pronounced emotional and nervous instability are considered contraindications for this type of therapy.

A temperature of 106 F. is produced and maintained for from four to six hours and at times for a total of twelve hours.

63. Ambler, J. V., and Van Cleve, J. Y.: Malarial Therapy in Syphilitic Interstitial Keratitis, J. A. M. A. **102**: 1553 (May 12) 1934.

64. Clark, C. P.: Effect of Malaria on Certain Syphilitic Conditions of the Eye, Tr. Am. Ophth. Soc. **32**: 453, 1934.

65. McIntyre, H. D., and McIntyre, A. P.: Fourteen Years' Experience with Malarial Treatment of Paresis and Other Forms of Neurosyphilis, J. Med. **19**: 440 (Nov.) 1938.

66. Hambresin, L.: Pyretotherapy in Ophthalmology, Arch. Ophth. **19**: 497 (April) 1938.

67. Coulter, John S.: Medical Diathermy, J. A. M. A. **106**: 209 (Jan. 18) 1936.

68. Neymann, C. A., and Osborne, S. L.: Artificial Fever Produced by High Frequency Current: Preliminary Report, Illinois M. J. **56**: 199 (Sept.) 1929.

69. Neymann, C. A., and Koetig, M. H.: Treatment of Dementia Paralytica: Comparative Therapeutic Results with Malaria, Rat Bite Fever and Diathermy, J. A. M. A. **96**: 1858 (May 30) 1931.

70. Bishop, F. W.; Lehman, Emmy, and Warren, S. L.: Comparison of Three Electric Methods of Producing Artificial Hyperthermia, J. A. M. A. **104**: 910 (March 16) 1935.

71. Bierman, William: Medical Applications of the Short Wave Current, ed. 2, Baltimore, Williams & Wilkins Company, 1942.

72. Weeks, Webb W., and Morris, S. A.: Induced Hyperpyrexia in Ophthalmology, Am. J. Ophth. **21**: 664 (June) 1938.

Weeks and Morris⁷² from their observations concluded that the therapy appears to be valuable in the ocular complications of gonorrhea, in iritis, in superficial punctate keratitis and in scleritis. They found it of little value in trachoma, syphilitic uveitis and interstitial keratitis.

Kettering Hypertherm.—A wide variety of other physical means has been employed to produce hyperpyrexia, including hot baths, hot air, electric blankets and various forms of radiant energy, such as electric lamps in a cabinet. Use of a radiant energy cabinet is the easiest and most convenient method. There is no apparent difference in the clinical effects from various types. Of the air conditioned cabinets, the Kettering hypertherm is the best known and most widely used.

The following description is from Kendall, Webb and Simpson's⁷³ article: The Kettering hypertherm is an insulated cabinet in which the nude patient lies with the head extending outside the cabinet. There is sponge rubber insulation around the neck where it projects through the cabinet. The patient lies on an air mattress supported by a boxlike bed which is rolled in and out of the cabinet at will. In the rear of the apparatus is a small insulated fireproof compartment for the air conditioning apparatus. The temperature of the air, recorded on a dry bulb thermometer, is controlled by a thermostat. The humidity is controlled by a "humidistat." The velocity of air within the cabinet is controlled by fixed speed blowers.

Induction of fever is accomplished by the circulation of heated air from air conditioning apparatus and from the heated mattress, together with the prevention of radiation and evaporation from the body by the cabinet.

With this method a rectal temperature of 105 F. or over is usually reached in from forty to sixty minutes. By adjusting the air temperature and humidity one may maintain the body temperature at the desired level. At the completion of the treatment defervescence is produced by streams of cooler air. The body temperature usually returns to normal in from thirty to forty minutes.

Culler and Simpson⁷⁴ regarded advanced age, myocardial insufficiency and aortic aneurysm as contraindications. McGavic⁷⁵ added to these renal disease, active tuberculosis and diabetes if not controlled. Controlled diabetes is not considered as a contraindication.⁷⁶

Constant observation by an especially trained physician and nurse-technician is regarded as an essential feature of the fever therapy. During the treatment water and cool 0.6 per cent saline solution are given by mouth to maintain the chloride balance. Mental and physical preparation for the treatment is also carried out in detail. Culler and Simpson⁷⁴ gave most of their patients ten weekly treatments of five hours each at a rectal temperature of from 105 to 106 F.

Culler and Simpson treated 58 patients with ocular syphilis with approximately fifty hours of fever. Interstitial keratitis seemed to be definitely benefited. In each of 10 cases of exudative uveitis prompt clinical improvement became apparent. Improvement was noted in optic neuritis and neuroretinitis, active choroiditis and optic nerve atrophy. McGavic⁷⁵ found the treatment most efficacious in gonorrheal conjunctivitis and

syphilitic iridocyclitis. Hasler and Speker⁷⁷ found it effective likewise in gonorrheal ophthalmia. Whitney⁷⁸ reported beneficial results in corneal ulcer. Prati⁷⁹ reported a case of syphilitic optic nerve atrophy which improved under pyretotherapy. There are similar reports from other authors. Krusen and Elkins⁸⁰ emphasized that the combination of fever therapy and administration of the sulfonamide compounds is much more effective than use of the sulfonamide compounds alone. The principal value of this form of therapy seems to be in the treatment of ocular syphilis. This is understandable when one remembers that the spirochete is susceptible to the higher degrees of fever.

The disadvantages and advantages of the Kettering hypertherm have been given by McGavic.⁷⁵

He observed the following disadvantages: The treatment is a very strenuous one attended by fear, fatigue and some danger of collapse and heat stroke. Constant nursing care is absolutely necessary, one nurse being required for each patient. The machine is rather expensive, and the cost of operation is rather high. The machines are accessible to only a limited number of practicing physicians.

The Kettering hypertherm offers the following advantages: High temperatures are readily attained and maintained when desired and the temperature is easily controlled. No new disease is added, as in malaria therapy. Hospitalization is often not necessary, the patient being treated as an outpatient or at most kept overnight. The action is rapid and the therapy can be given three times a week for acute processes and weekly for the more chronic. Any other treatment, local or general, directed toward ocular or systemic disease may be given concurrently. Antisyphilitic chemotherapy is considered more effective when combined with fever therapy. Typhoid vaccine and other nonspecific proteins can be injected between fever treatments.

More investigation is necessary before definite conclusions can be drawn as to the proper place of air conditioned fever cabinets in artificial hyperpyrexia.

CONCLUSIONS

From a review of the subject of fever therapy in ophthalmology it would appear that certain conclusions are justified.

1. Milk injections are of particular value in the treatment of infants, especially those with ophthalmia neonatorum, since the injections usually cause a fever of 100 to 103 F. This applies even though the sulfonamide compounds are used, as it has been shown that their action is greater in the presence of elevated temperature.

2. Diphtheria antitoxin has many disadvantages, but its use in the treatment of sympathetic ophthalmia seems justified.

3. Typhoid vaccine is the most useful and generally used agent to produce fever for the treatment of acute lesions of the eye and its adnexa. On the theory that vasodilatation may be a factor in the beneficial results, smaller doses administered over a longer period seem as effective and cause less shock and discomfort. The temperature reaction in a series of cases in which

73. Kendall, H. W.; Webb, W. W., and Simpson, W. M.: Artificial Fever Therapy of Gonorrheal Arthritis, *Am. J. Surg.* 29:428 (Sept.) 1935.

74. Culler, A. M., and Simpson, W. M.: Artificial Fever Therapy in Cases of Ocular Syphilis, *Arch. Ophthalm.* 15:624 (April) 1936.

75. McGavic, J. S.: Fever Therapy in Ocular Diseases, *Arch. Ophthalm.* 10:769 (May) 1938.

76. Desjardins, A.; Stuhler, L. G., and Popp, W. C.: Fever Therapy for Gonococcal Infection, *J. A. M. A.* 104:873 (March 16) 1935.

77. Hasler, W. T., and Speker, Louis: Artificial Fever in the Treatment of Gonorrheal Ophthalmia, *J. A. M. A.* 107:102 (July 11) 1936.

78. Whitney, E. L.: Artificial Therapy in Treatment of Corneal Ulcer and Acute Iritis, *J. A. M. A.* 104:1794 (May 15), 1935.

79. Prati, L.: A Case of Luetic Optic Atrophy Treated with Pyretotherapy, *Riv. oto-neuro-oftal.* 12:288 (March) 1935.

80. Krusen, F. H., and Elkins, E. C.: Investigations in Fever Therapy, *Arch. Phys. Therapy* 20:77 (Feb.) 1939.

smaller doses were used corresponded closely to that obtained in a series in which the average first dose was 53 million and the average second dose was 80 million organisms. There are certain rather definite contraindications to its use.

4. When a milder fever is indicated or the patient's condition does not warrant typhoid vaccine, the use of Coley's mixed toxins is advisable. This preparation has the advantage that hospitalization is not necessary.

5. Omnadin has a place in the treatment of acute conditions when shock therapy must be avoided but leukocytosis and a rise in the antibody content of the blood are desirable. It is not as effective as typhoid vaccine or other forms of foreign protein but can be used when they are contraindicated.

6. The use of malaria is not justified for ophthalmic diseases.

7. Hyperpyrexia induced by high frequency methods is still in the experimental stage. Further observations are necessary to disclose the conditions in which it is most effective and to establish the dosage compatible with safety.

8. Of the various physical means used to produce hyperpyrexia, air conditioned cabinets of the Kettering hypertherm type are best. Production of fever by physical means is most efficacious in the treatment of gonorrheal conjunctivitis and syphilitic keratitis and iridocyclitis. It is particularly useful in the treatment of syphilitic diseases of the eye. Because of the severity of the treatment it should be used only in those cases in which other forms of therapy are unsatisfactory.

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ABSTRACT OF DISCUSSION

DR. EVERETT L. GOAR, Houston, Texas: In recent years I have confined my efforts in fever therapy to the use of typhoid antigen given intravenously. I prefer the H antigen because it produces the same therapeutic results as the mixed vaccine, with less discomfort. It seldom causes a chill unless given in a large dose, and the chill is not an essential part of the reaction. The initial dose should vary with the age, size and physical condition of the patient and with the severity of the infection. It is well to start with a small dose—about ten million, unless the infection is a virulent one. Formerly I always hospitalized patients before the initial doses, but with a scarcity of hospital beds I now make an intradermal test and, if this is negative, give them an intravenous injection and let them go home with instructions to keep quiet and to keep a temperature chart. They return in forty-eight hours and the dose is increased. This is the best treatment for anterior uveitis which is not tuberculous or syphilitic in origin. It is much less efficient in posterior uveitis and I am not at all sure of its value in optic neuritis. The only two possible dangers of this type of therapy are (1) anaphylaxis and (2) overdosage or too frequent dosage. Most of the severe reactions are due to the latter. Anaphylaxis may be avoided by preliminary intradermal testing, and untoward reactions may be prevented by small initial doses and by waiting long enough for a secondary rise in temperature to subside before repeating the dose. I have given hundreds of doses to all ages of people, many of them old and in poor physical condition, following these simple methods, and have never seen an alarming reaction.

DR. SANFORD R. GIFFORD, Chicago: In view of the proved efficacy of the sulfonamide drugs in gonococcal infections, the use of foreign protein injections are quite possibly unnecessary in gonococcal conjunctivitis of the newborn. It would be interesting to see a carefully controlled series of patients with gonococcal conjunctivitis treated with sulfathiazole plus fever. Most ophthalmologists will prefer the use of typhoid vaccine for adults or of milk for babies. In acute iridocyclitis the situation is somewhat different. In the absence of syphilis the evidence of a bacterial agent is often wanting, while exact bacteriologic

diagnosis is usually impossible. Most of us at Northwestern University still feel that foreign protein therapy, with or without the sulfonamide drugs, is of considerable value. We employ typhoid vaccine by vein and still find that the dosage of Allen, from 30 to 80 million organisms, usually produces the desired reactions. It is interesting that Dr. Cordes was able to produce such definite reactions with much smaller doses. Fever in our patients is probably, on the average, somewhat higher than in his series, often rising to 103 F. and occasionally to 104 F., but it is by no means certain that the results are superior to his. The preparation of vaccine employed certainly plays a part. The prepared proteins with which fever is not produced would seem to have little to recommend them. In syphilitic iridocyclitis the results of specific therapy are usually so good that it would seem unnecessary to submit these patients to hyperpyrexia. In nonspecific chorioretinitis the case for fever therapy is about the same as in iridocyclitis, except that the results are less dramatic and more difficult to evaluate. The same may be said of fever therapy in optic neuritis and retrobulbar neuritis. Here the evidence for any therapy is vitiated by the tendency to spontaneous recovery in most cases, at least during a first attack. We still employ typhoid vaccine along with large doses of thiamine hydrochloride. Future attacks may be expected in many cases, and the later signs of multiple sclerosis can hardly be prevented by this treatment. In serpent ulcer there still seems to be a place for fever therapy. As Brown has shown, intravenous typhoid vaccine does increase the concentration of antibodies in the aqueous and, presumably in the cornea. With sulfonamide therapy results are undoubtedly better than with fever therapy and local treatment alone. With the use of early keratotomy I have obtained the impression that fever therapy is often unnecessary. Hyperpyrexia by physical means has a definite place in the treatment of those forms of syphilis which are resistant to chemotherapy alone. These are practically limited to interstitial keratitis and optic atrophy. In optic atrophy our experience has been small. In these two exceedingly serious syphilitic conditions it would certainly seem that fever therapy is justified in spite of its admitted inconveniences and expense. The hypertherm would seem, for many reasons, superior to malarial inoculations.

DR. GRADY CLAY, Atlanta, Ga.: My earliest experience was with the use of boiled milk, using it for a child who was admitted to the hospital with a perforated injury to the cornea of a day's duration, and the eye then showed a beginning panophthalmitis. With daily injections of milk the eye promptly cleared. Such a spectacular cure in a heretofore hopeless situation made me an early staunch advocate of such a therapeutic agency. In our clinic at Emory University we have continued to use boiled milk because we have had good results and there is no expense connected with its use. In private practice I now use subcutaneous injections of proteolac and intravenous injections of typhoid vaccine. In every case in which intraocular surgery is done I use the intramuscular injection of foreign protein. I use it routinely in all infected bacterial corneal ulcers, many of the interstitial keratitis cases, and all cases or intraocular inflammations such as iritis, iridocyclitis, uveitis, acute exudative choroiditis and severe types of optic neuritis, especially those associated with encephalitis. I think it best to admit the service patients to the hospital and use intravenous typhoid vaccine as outlined by Dr. Cordes. In using typhoid one should never overlook its dangers, and for that reason it should not be given at the office or at home. The various photographs shown are too numerous to publish but show clearly the different stages of angiospasm, arteriolar sclerosis and the other hypertensive stage discussed in this paper.

DR. FREDERICK C. CORDES, San Francisco: Typhoid H antigen is often regarded as being without danger, owing to the fact that it can be given in the office. Because of this two points brought out by Dr. Goar bear emphasis, namely the possible danger of anaphylaxis and overdosage. He doesn't give his method of doing the intradermal test but I imagine it coincides with that of Brown, who advocates the intradermal injection of 1 minim (0.06 cc.) of a solution of H antigen (25 million organisms per cubic centimeter). If no local reaction takes place within twenty to thirty minutes, he feels that

the patient is not sensitive. I agree with Dr. Gifford that the sulfonamide drugs are so effective in ophthalmia neonatorum that milk injections are probably unnecessary. In the use of fever therapy it is well to remember that a patient who has had typhoid may not react to typhoid vaccine. In such a case seen recently hyperpyrexia by physical means was found useful in helping to control a severe uveitis. I agree with Dr. Clay that typhoid vaccine should not be given at the office or at home because of the possible reactions that may at times be encountered in its use.

PLASTER OF PARIS CASTS

AN EXPERIMENTAL AND CLINICAL ANALYSIS

CAPTAIN J. VERNON LUCK

MEDICAL CORPS, ARMY OF THE UNITED STATES

Wars impel us to improve our technic of applying casts. It was to enable him to use plaster of paris conveniently on the battlefield that led A. Matthysen, a medical officer in the Dutch army, to invent and describe the plaster of paris bandage in 1852. He employed a coarse cotton bandage and manually rubbed plaster of paris into it, very much as we do today. This was a great improvement over the method of mixing the plaster of paris with water and pouring it into a box enclosing an extremity, a method that had been in use for the preceding half century.

In every war since the Crimean (1854-1856), plaster of paris has been extensively used; but in this present conflict there will be more plaster of paris used than in all previous wars combined. For many wounds, encasement in plaster of paris represents the best method of treatment.

During the past 2,500 years, man's search for the ideal cast medium has never ceased. A multitude of materials have been utilized, many of which have been recommended by their creators as superior to plaster of paris. However, nothing now known threatens the position of plaster of paris as the most universally acceptable cast material we possess.

Through the decades of the past 150 years the pendulum of popularity has swung to and away from the use of plaster of paris many times. Critics of its use have had their day only to see plaster encasement again rise as a dominant method of treatment. Numerous errors in the use of this method of treatment have been corrected only to be forgotten and later rediscovered and recorrected.

From the standpoint of the plaster itself, so much has been accomplished by manufacturers that most plaster of paris and crinoline now on the market is consistently good. Far more of the unsatisfactory casts examined were the result of poor technic of application than the result of defective plaster of paris and crinoline. Of course the bandages must be well made; if they are too tightly rolled they soak incompletely and have dry spots; if too loosely rolled they telescope. Since there are comprehensive treatises available on the preparation of plaster bandages,¹ this paper will deal principally with the technic of application. Each detail in the technic of applying plaster of paris casts and splints will be analyzed in terms of its capacity to

weaken or strengthen the cast. Several important points herein advised are based on the results of experiments.

THE SETTING PROCESS

Since an understanding of the setting process and chemistry of plaster of paris is indispensable to good plaster technic, a brief description is in order. Plaster of paris (anhydrous calcium sulfate) is mined from underground deposits where it exists as a solid crystalline material known as gypsum (hydrated calcium sulfate). In its natural state gypsum is mixed with impurities such as silicates, iron and carbonates. To refine gypsum and transform it to plaster of paris, it is heated to around 120 C. to drive off most of the water of crystallization, $2(\text{CaSO}_4 \cdot 2\text{H}_2\text{O}) \rightleftharpoons (\text{CaSO}_4)_2 \cdot \text{H}_2\text{O} + 3\text{H}_2\text{O}$. Removal of nearly 100 per cent of the impurities and the addition of a proper accelerator to reduce the length of the setting time completes the preparation of orthopedic plaster of paris.

When plaster of paris is soaked in water it promptly takes up water and goes back into a solid crystalline state. Viewed microscopically, crystals rapidly form and interlock. It is the tight interlocking of the crystals that gives the plaster much of its ultimate strength. But this important phenomenon will not properly occur unless the plaster is undisturbed during most of the setting process. This can be observed both microscopically and clinically. No single point in the application of plaster of paris is more important or deserves more emphasis than the protection of the plaster from movement during that decisive period when the plaster is going from a fluid to a solid state. In appreciating the need for immobilization during this initial setting period, it is helpful to view the crystallization process microscopically. Figure 1 is a photomicrograph of plaster of paris in powdered form ready for use. In figure 2, water has been added and the crystals have been allowed to form and set undisturbed. Figure 3 indicates the pattern of a field of crystals that were disturbed by a moderate amount of movement during the period when the powder was taking up water of crystallization and consolidating. A comparison of figure 2 and figure 3 reveals two important differences. First, the crystals in figure 2 are closely interlocked, as compared to a loose interlocking in figure 3. Second, the crystals in figure 2 are long and thin, whereas those in figure 3 by comparison are short and thick. For maximum strength in a plaster of paris cast or splint, everything possible must be done to encourage the proper formation and interlocking of the crystals.

It is extremely important that physicians and technicians who apply plaster of paris casts and splints become familiar with what may well be termed the "critical point." The "critical point" may be defined as that point in the setting process when immobility of the plaster becomes imperative if the cast or splint is to set properly and become rigid. Molding the cast, changing the position of a joint or fracture fragment should be carefully avoided subsequent to the "critical point." Recognizing the "critical point" requires experience and varies with different brands of plaster. In general it is reached when the plaster has attained the consistency of thick cream. Once the plaster loses its wet glistening appearance or becomes grainy, the "critical point" is past. When in doubt, errors should be made on the side of safety.

When water is added to plaster of paris powder, the crystals that form are about one-fifth water of crystallization. After the plaster sets, all water in excess of that

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Experiments herein reported were made possible through funds and facilities provided by the Douglas Aircraft Company of Santa Monica, Calif. Engineers from the stress group, Mr. Charles Strang, chief stress engineer, Mr. Louis Abraham and Mr. George Halgedahl did the calculations and assisted in the experiments.

1. McLin, W. C.: Hospital Made Plaster Bandages, *Modern Hosp.* 55: 51 (Aug.) 1940.

required for the crystallization process disappears by evaporating from the surface. In thin casts this may take place in a matter of hours, but in thick casts it is usually a matter of days. The rate with which evaporation occurs depends on the air, its humidity, its tempera-

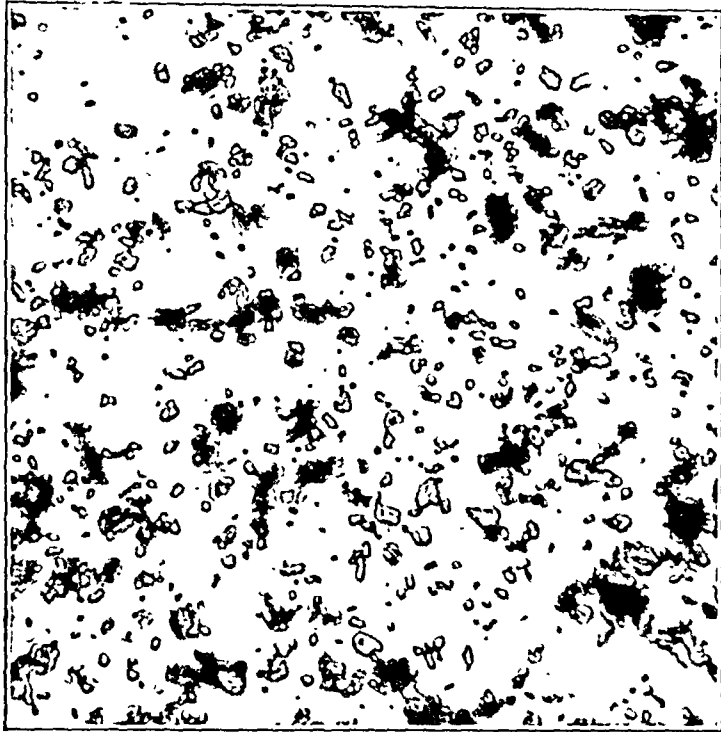


Fig. 1.—Plaster of paris in powdered form ready for use ($\times 300$).

ture and its circulation around the cast. Casts may appear dry on their surface and contain considerable water in their deeper layers. The experimental casts had to be dried for seven days to assure that virtually free water in them had evaporated. In some of the st tests, casts one or two days old were used and



Fig. 2.—Plaster of paris crystals ($\times 300$) which were not disturbed during the setting process. Note the compact interlocking of the crystals.

when compressed only a few hundred pounds in the Southwark machine they would not crack or break but would simply flow and collapse, and drops of water would appear on the surface. There was a steady increase in strength of the casts for the first three to

six days as more and more of the excessive water came to the surface and evaporated.

It is a mistake to assume that a cast attains its full strength the first day after application. In wet, humid climates a heavy cast may remain weak and wet for many days. Under such circumstances a cast drier and free circulation of air around the cast are indispensable. When evaporation from the surface of a green cast is prevented by heavy blankets or humid air, the cast will frequently become rubbery and useless.

EXPERIMENTAL PLAN AND SETUP

Plaster of paris cylinders were made on three piece wooden forms. Three piece forms were made so that a wedge shaped center section could be drawn out after the cast had set, thus making it easy to withdraw the two lateral parts of the form. It is far simpler to remove a three piece form from a plaster of paris cylinder than it is to remove a form made in one piece. Two types of plaster cylinders were made: one for a compression test setup and the other for beam-test

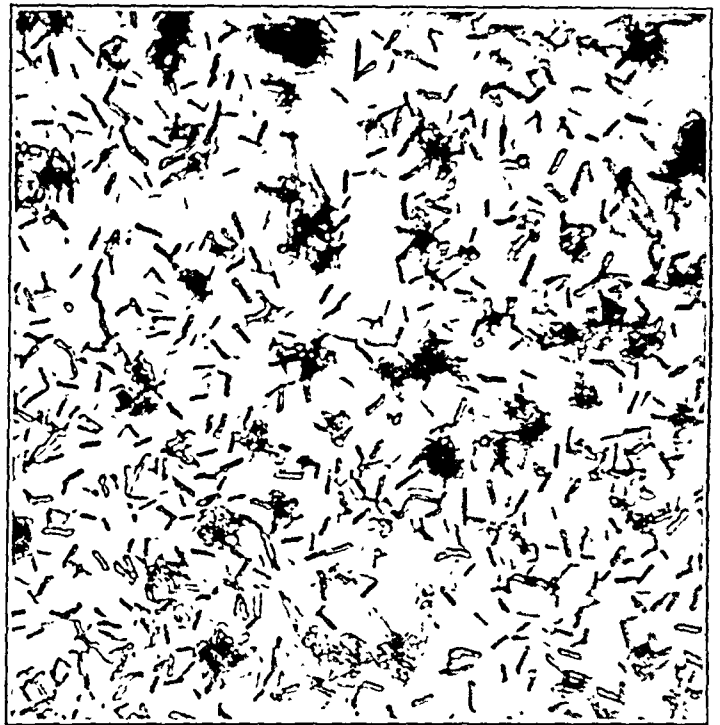


Fig. 3.—Plaster of paris crystals ($\times 300$) that were disturbed by motion after the "critical point" in the setting process. Note the sparse interlocking of the crystals.

experiments. Compression-test casts were made 12 inches long, beam-test casts 26 inches long, and all casts were 5 inches in diameter. Plaster bandages 4 inches wide and 5 yards long were used, and most of the casts were six layers thick.

Plaster bandages and splints were kept uniform in size and in plaster content. For further uniformity, I made all plaster cylinders. Each cylinder was dried under the same heat and humidity for seven days before testing. All casts were reinforced on the ends to prevent end failures.

The machine employed for testing the load capacity of the plaster cylinders was a Southwark machine of 60,000 pound capacity (fig. 5). The compression test setup is shown in figure 6. To assure uniform compression, ends of casts were sawed square and smooth and each cylinder was placed in the Southwark machine vertically between two firm rubber pads. Except when testing the strength of cast reinforcements, the compression test was considered most indicative of the strength of the plaster-crinoline combination.

In the beam-test setups (fig. 5), the cylinder rests in a wooden cradle which contacts the cylinder only at its ends. A wooden saddle sits on top of the cylinder beneath the compressing head of the Southwark machine. Cradle and saddle contacts with the cylinder were covered with rubber. Two wooden bulkheads 3 inches thick were placed in each end of the cylinder to prevent end failures. It was the area of the cylinder between the saddle ends that was being tested, and, with the type of loading shown, a uniform moment was assured.

For each individual test, two to four identical plaster cylinders were made. Additional cylinders were made later if tests on identical cylinders showed more than a slight variation in strength.

Actual figures representing results of the various tests have only a relative value. They represent results from one particular brand of plaster and crinoline. A few tests were made using different brands of plaster

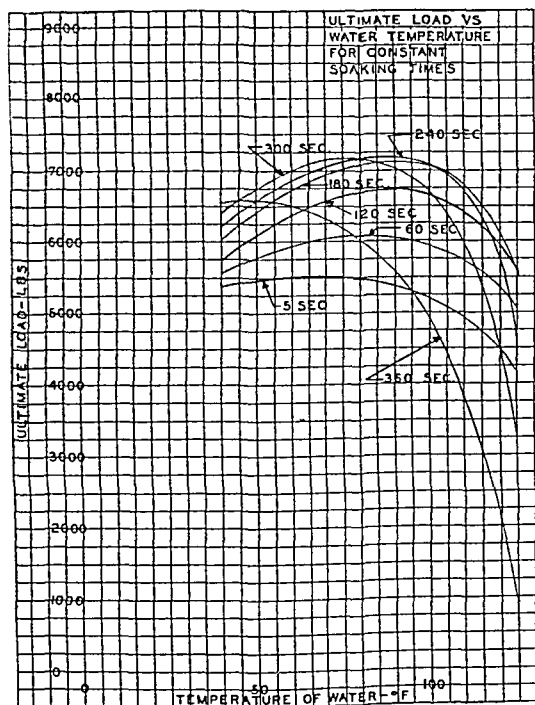


Fig 4—Ultimate load versus water temperature for constant soaking time.

and all showed similar values. No attempt was made to determine the relative merits of the various brands of plaster of paris now available.

EFFECT ON ULTIMATE STRENGTH OF BENDING THE CAST DURING THE SETTING PROCESS

In this experiment the compression test setup was used and the plaster bandages soaked five seconds in water at 95 F. Two series of cylinders were made, one series for control, which were undisturbed during the setting process, and the other series, in which each cast was bent once during the setting process. The bend was to an angle of approximately 25 degrees, following which the cylinder was immediately straightened and the setting process allowed to proceed to completion. Such a solitary bend was made in the cylinders during various stages of the setting process from the "fluid" to the "solid."

During the fluid stage no reduction in strength resulted from the bend. The casts bent directly after the "critical point" in the setting process showed a

77 per cent reduction in their ultimate strength, as indicated in table 1. During compression of these casts the breaking point invariably appeared at the site in which the cast had been bent. Those casts that were bent after they had become solid never regained rigidity

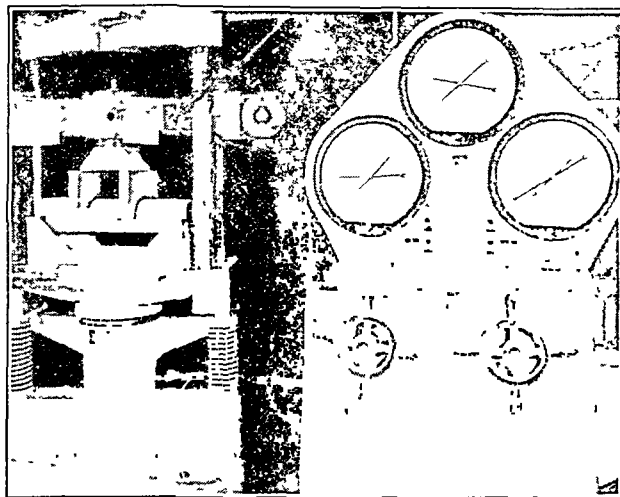


Fig. 5.—Southwark stress testing machine and the setup used for beam tests.

at the site of the bend and so were not tested. The earlier in the setting process a cast is bent, the less will be the damage to the ultimate strength; the later the bend, the greater the damage.

In analyzing several hundred defective plaster of paris casts that had been used clinically, more were found to have been weakened by having been bent or compressed following the "critical point" in the setting process than by any other single cause. Sources of erratic bendings and compression were as follows:

1. Too slow application of the cast and too rapid setting time of the plaster often lead to movements in the cast long after the "critical point." The setting time of the plaster should be sufficiently long to permit application of the cast before an appreciable degree of setting

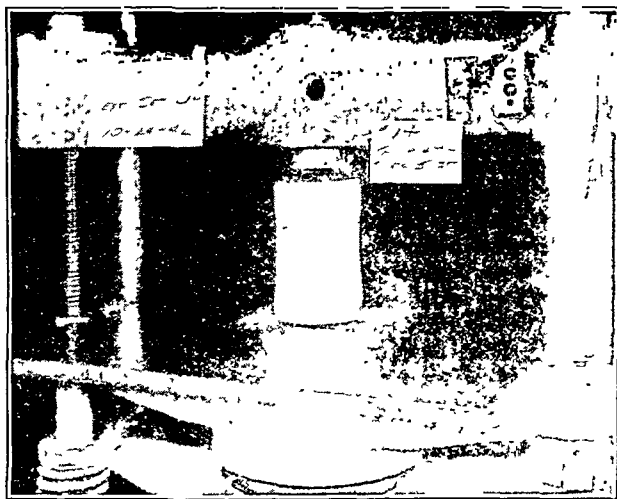


Fig. 6—Compression test setup

occurs. A method of varying the setting time without the use of chemicals is to be described later.

2. Fracture fragments and joints should be placed in their proper position and alignment before the cast is applied. A change of position after the cast has been applied is not only a source of wrinkles and pressure

points inside the cast but very often greatly weakens the cast by disrupting the setting process.

3. In the case of body casts and shoulder and hip spicas, do not move the patient too soon after the cast has been applied. A bend or break in the cast often occurs when the patient is moved onto a litter or turned in bed. A bend or break after the cast has become solid may so weaken it as to render it useless.

4. Molding and heavy rubbing, if too prolonged, can greatly weaken a cast and therefore should be avoided except during the fluid stage. Extensive molding is usually made necessary by the use of a thick layer of padding. This padding is more of a liability than an asset to good plaster technic. Only occasionally is more than a thin layer of padding indicated. Plaster bandages should be laid on, not drawn on. When thick padding is used there is a strong tendency to apply the plaster bandage under tension, which is always a dangerous procedure. With thick padding there is increased opportunity for friction to occur between the skin and the cast. Painful points are produced more frequently

by friction in a thickly padded cast than by pressure from casts having little or no padding.

5. During its application, if a plaster bandage becomes stiff or grainy it should be discarded. If stiff, the plaster has set too much to fuse into the cast or the crinoline is defective and failed to soften when soaked. In either instance the bandage should not be used. A stiff bandage, by not adapting itself to body contours, invites pressure points. Grainy plaster is

plaster that has already set and would detract from rather than add to the strength of the cast. A rubbery cast is usually the result of using partially set bandages. Plaster bandages should be applied in rapid succession so that all layers will fuse to form a solid cast. A time interval between bandages invites lamination, one of the most common defects found in plaster casts. Ideally, the entire cast should be completed before any of the plaster in it passes the "critical point" in initial set. If bottom layers set before top layers are applied, application of the top layers may create movements in the bottom layers, thus impairing their strength.

7. Wedges and large windows should not be made in green casts when avoidable. A green cast tends to compress at the site of wedging, and a large window may lead to a bend or break in the remaining circumference.

ULTIMATE STRENGTH OF PLASTER CASTS AS RELATED TO TEMPERATURE OF WATER AND LENGTH OF SOAKING TIME

In treatises on plaster of paris, little has been said of the influence of the temperature of the water and length of soaking time on the strength of the cast. Since varying the temperature of the water has a decided

effect on the length of the setting time of plaster of paris, it was decided to prepare a series of plaster cylinders, graduating the soaking time and the temperature of the soaking water. Twenty-eight sets of cylinders were made, seven sets for each of four temperatures: 40, 70, 95 and 125 F. At each of these four tem-

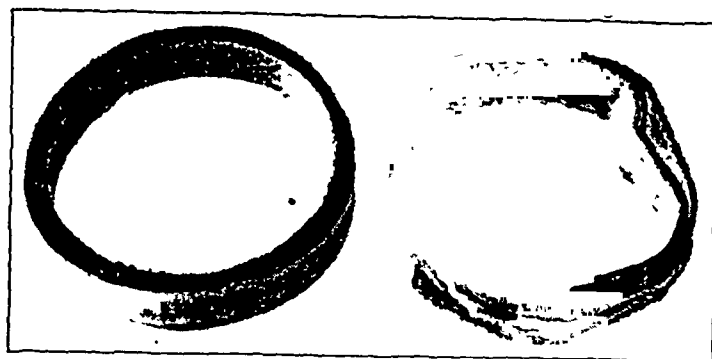


Fig. 8.—Section at left was from a cylinder made by good technic. The section at the right was from a cylinder that was bent once soon after the "critical" point in the setting process.

peratures a set of cylinders was made for each of the seven different length periods of soaking: five seconds, one minute, two minutes, three minutes, four minutes, five minutes and six minutes. The compression test setup was used. With the five seconds soaking time, little alteration in the strength of the cast occurred

TABLE 1.—An Experimental Indication of the Damaging Effect of Bending a Plaster of Paris Cast Following the "Critical Point" in the Setting Process

Test Number	Soaking Time	Temperature of Water	Average Load (Compression)	Comment
1	5 seconds	95 F.	5,300 pounds	Prepared under optimum conditions
40	5 seconds	95 F.	3,600 pounds	One bend directly after "critical point"

from varying the temperature of the water; but as the period of soaking was increased there was a steady rise in strength of the casts until the soaking time reached four minutes, with the temperature of the water at 95 F. At a soaking time of four minutes or longer and with the temperature of the water above 95 F., cylinders showed a rapid and progressive decline in strength.

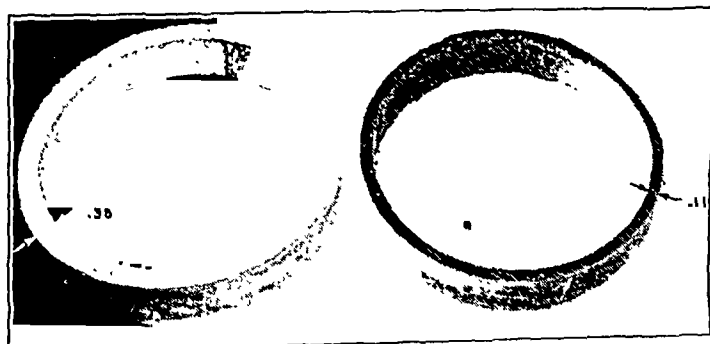


Fig. 9.—Section on right from a cylinder made of plaster bandages forcefully wrung out immediately on removal from the water, with a pronounced loss of plaster. Section on left was from a cylinder made of plaster bandages which were properly soaked and drained.

Using water at a temperature of 40 F., there was a progressive increase in strength of the casts as the soaking time was increased (five seconds to six minutes). Cylinders exhibiting the greatest resistance to compression stresses were those made with the water at 70 F. with a soaking time of four minutes.

Plaster that was deposited in the bottom of the bucket after all rolls used for each individual cast had been soaked and removed was saved and weighed. At a soaking time of five seconds the accumulation was as much as 35 per cent of the plaster originally incorporated in the bandages. When the soaking time was progressively increased, the amount of plaster in the bottom of the bucket progressively decreased until at a soaking time of three minutes to six minutes there was only an insignificant amount of plaster lost from the rolls.

Applying a cast to a wooden form is not quite the same as applying a cast to an arm or a leg. In the case of the experimental cylinders they were applied in about three minutes and allowed to set without the slightest disturbance. Since the wooden forms were rigid there was no disturbance of underlying layers as top layers were applied. In tests on the influence of long periods of soaking, the plaster frequently had thickened and setting was near the "critical point" when the bandages were removed from the soaking water. In such instances even a brief delay would have resulted in a defective case, owing to manipulation of the bandages subsequent to the "critical point" in the setting process. In those instances of long periods of soaking in which the cylinders proved to be weak, the plaster had passed the "critical point" at the time it was removed from the water or did so during the application of the bandages.

It is generally agreed that the use of such materials as salt to accelerate the setting time and sugar to retard the setting time is an unwise practice in most hands. Varying the temperature and soaking time is a good method of accelerating or retarding the setting time. At 40 F. the initial setting time was approximately three times as long as it was at 125 F. with a soaking time of three minutes.

In general it may be said that the earlier in the setting process that the cast can be completed and kept quiet until it sets, the greater the ultimate strength of the cast. In applying small casts that can be applied quickly, or if the setting time of the plaster is excessively long, it is permissible to prolong the soaking time until the plaster attains a creamy consistency. Such a practice should not be carried too far in an attempt to retain all of the plaster in the bandages.

When soaking is completed, the bandages should be gently removed from the bucket and allowed to drain for ten or more seconds in another bucket, a perforated receptacle or sink, before gently compressing out remaining excess water. Squeezing the bandage immediately on removal from the water presses out much of the plaster that could have been conserved by proper technic (fig. 9). Since plaster of paris that accumulates in the soaking water accelerates the setting time, it is best to use an abundance of water, drain the rolls outside the bucket in which they are soaked and use a bucket of water for not more than six bandages.

REINFORCEMENT OF PLASTER OF PARIS CASTS

In applying a cast to immobilize a joint moving predominantly in one plane, such as the knee and elbow, there has been a difference of opinion regarding the site for most effectively reinforcing the cast. Opinion is divided as to whether reinforcement is more effective when placed on the anterior and posterior surfaces or when placed laterally and medially. Stress engineers have long known the answer to this question. The answer evolves from a basic principle of mechanical

engineering; in fact, the pattern of construction of the much used I beam is based on this principle.

By calculations (table 2) reinforcements placed front and back in a cast over a joint moving in one plane are much more effective than similar reinforcements placed on the sides. Tests were made to determine whether or not these calculations could be corroborated experimentally. Plaster cylinders were made with rein-

TABLE 2.—Calculations

Referring to the beam test setup (fig. 5), the moment on the center of the cylinder was:

$$\frac{P}{2} \times 8 = 4P \text{ inch pounds.}$$

S = number of inches from each end of cradle to end of saddle.
 P = pounds of force exerted on saddle.

If the maximum allowable unit stress is represented by S and the distance to the outer fiber from the neutral axis is represented by O :

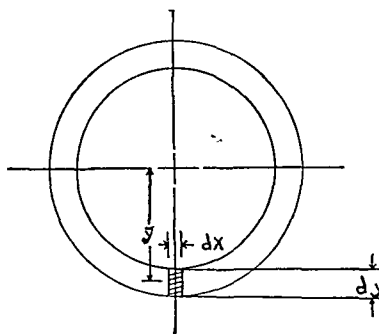
$$S = \frac{MO}{I}$$

M = Moment
 I = Moment of inertia

$$M = 4P = S \times \frac{I}{O}$$

$$P = KI \left(K = \frac{SO}{4} \text{ which is constant} \right)$$

Thus, the larger the value of I , the greater load the cast will sustain. I is the moment of inertia of the cross section of the cylinder and is a function of the placement of the material.



$$I = \sum y^2 dA$$

$$dA = dy \cdot dx$$

This relationship indicates the more remote the concentration of material from the neutral axis, or axis through the center of gravity of the cross section, the greater the load carrying ability of a given cross sectional area of material. This was borne out in the beams tested (table 3).

forcement at top and bottom and others with reinforcement on the sides. Cylinders were also made with all of the reinforcement on one aspect to determine whether it is better to divide the splints between two opposite aspects of the cylinder or concentrate them on one surface. Plaster splints 4 inches in width were used for the reinforcements and were incorporated into the casts their full width, except in one series of cylinders in which the splints were folded longitudinally on themselves to give a splint 2 inches wide with double the number of layers. By calculation, the narrow thick splint offers stronger reinforcement than does a wide thin splint. To complete the beam test group, a series of cylinders was made in which yucca board splints were incorporated into the casts in place of plaster splints.

The experimental results showed that anterior and posterior reinforcements added more strength to the cast than did similar reinforcement on the side, as was indicated by the calculations. There was remarkably little disparity between the calculated strength and the strength determined by experiment. By calculation the splints placed anteriorly and posteriorly should have

produced casts that were 39 per cent stronger. An increase in strength as substantial as this has real practical value.

The results of test 20 (table 3) indicate that it is better to divide the splints between front and back than to place them all on the compression side. A division of the splints was an average of 26 per cent stronger.

Test 23, in which the splints were folded on themselves to produce narrow splints with double the number of layers, revealed a substantial increase in strength, as was also indicated by the calculations. The farther from the neutral axis the reinforcement is concentrated the greater will be the strength imparted to the cast. In the case of a cast applied to immobilize such joints as the knee or elbow, this means the closer to the midline anteriorly and posteriorly the reinforcement is concentrated the better for the cast. Conversely, the closer to the lateral midlines the reinforcement is placed, the less the strength contributed to the cast.

In analyzing cylinders in which wooden splints had been incorporated, a single yucca board splint was found to add more strength to a cast than a plaster splint 4 inches in width and six layers thick. In order to key

TABLE 3.—Average Load, Type of Failure and Figure of Merit with Different Arrangements of Similar Reinforcing Plaster Splints

Test Number	Load in Pounds (Average)	Type of Failure	Comment	Figure of Merit
31	445	Tension	No reinforcement	1.00
26	815	Tension	Three layer splint top and bottom (anterior and posterior)	1.85
24	585	Tension	Three layer splint on each side (lateral and medial)	1.31
20	645	Tension	Six layer splint on compression side (posterior)	1.36
33	760	Tension	Six layer splint 4" wide on compression side, folded longitudinally to 2" width and twelve layers	1.71

nonplaster splints into the casts so that they would not separate from adjacent layers of plaster, it was necessary to make multiple perforations or notches in the splint. This procedure substantially increases the strength of the cast, especially on the tension side.

USE OF PLASTER SPLINTS OR SLABS ALONE

A point must be emphasized regarding the use of plaster splints or slabs alone; that is, without incorporating them into a cast. The principles guiding the use of splints incorporated into casts do not hold when splints are used alone. In fact, the mechanical principles involved are just the opposite in important respects. Splints used alone offer much stronger support when placed on the sides than when placed front and back. Also splints used alone are more effective when broad and thin than when narrow and thick. In applying molded plaster splints anteriorly or posteriorly, it is best to make them broad so that they extend well onto the sides. When feasible, plaster splints should be applied exclusively on the sides. By calculation it is possible for splints placed on the sides to be as much as sixteen times as resistant to bending stresses as similar splints placed anteriorly and posteriorly.

SUMMARY

1. Immobilization by encasement in plaster of paris is an indispensable part of the treatment of many war wounds and demands good plaster technic. Good plas-

ter technic means rapid application of the cast, comfort and protection to the patient, the use of a minimum of plaster, and less difficulty in transportation.

2. Plaster of paris, a powder, transforms to crystals when mixed with water. In the crystalline state it depends principally on compact interlocking of the crystals for its rigidity and strength.

3. The "critical point" is that time in the setting process when the plaster crystals interlock and give the cast rigidity and strength. Movements of the cast, such as changes of alignment and molding after the "critical point" in the setting process, mean impairment of the ultimate strength of the cast. The later after the "critical point" the cast is manipulated, the greater will be the damage. Of the defective casts analyzed, more had been impaired by manipulation after the "critical point" than by any other single cause.

4. Detection of the "critical point" requires practice and varies with different brands of plaster, but in general it is that point when the plaster is of the consistency of thick cream and begins to lose its wet glistening character. When the appearance of the plaster has become dull and the cast is becoming firm, the "critical point" is passed.

5. Lamination of casts occurs when one layer of plaster-crinoline dries before another is applied, preventing fusion of adjacent layers. When fresh plaster is wrapped over a dry plaster surface, the dry surface should first be roughened by scratching it with a sharp knife. This is necessary when casts have to be applied in segments, e. g. a cylinder for a shaft fracture of the tibia and fibula, then the foot portion, then the thigh portion.

6. Most plaster of paris and crinoline now available is good. More unsatisfactory casts are the result of poor technic of application than derive from defective plaster of paris and crinoline. To overcome bad technic of application, a great excess of plaster is frequently used. The use of two or more times the required number of plaster rolls and splints is often observed.

7. A cast does not attain its full strength until the water within it in excess of that needed for "water of crystallization" evaporates. This process may require several hours for small casts and several days for large ones. Arrangement for air to circulate around the cast until it dries is important. If a large wet cast is kept covered with heavy bed clothing, the cast may lose its rigidity and become rubbery and useless. This is especially true in humid climates.

8. The use of such materials as sugar to retard the setting time and salt or borax to accelerate the setting time should be avoided under most circumstances. Cold water effectively retards the setting time and warm or hot water accelerates it. Varying the temperature of the water and the length of the soaking time are usually adequate to regulate the setting time. Water at a temperature of 70 to 95 F. and a soaking time of about one minute are ordinarily employed.

9. In the defective casts analyzed, more painful points resulted from friction beneath thickly padded casts than resulted from pressure when little or no padding was used. When no padding is used a plaster splint is best applied anteriorly and posteriorly before applying the plaster bandages. The bandages should be "laid on," never "drawn on."

10. With reinforcing casts that encase the ankle, knee, elbow and wrist, the reinforcement should be placed front and back and not on the sides. Major reinforcement for the shoulder in shoulder spicas should

be over the top of the shoulder and in the axilla; for hip spicas reinforcement should be placed anteriorly, posteriorly and laterally, with the strongest reinforcement laterally.

11. Splints contribute more to the strength of a cast when they are thick and narrow than when they are thin and wide. Nonplaster splints should be perforated or notched in order to key them into the cast.

12. When plaster splints and slabs are used alone and not incorporated in a cast, the rules for their application are opposite in two respects to their use in casts. In immobilizing joints moving predominantly in one plane, such as the knee and elbow, splints or slabs used alone are stronger when they extend well up on one or both sides or are used exclusively on the sides. Further, they are better used thin and broad, rather than narrow and thick.

SEMIMEMBRANOSUS BURSITIS

ASSOCIATION WITH TEAR OF THE INTERNAL
MENISCUS OF THE KNEE JOINT
BY COMMON TRAUMA

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The usual popliteal cyst is the enlarged semimembranosus bursa. This constant bursa is located beneath the deep fascia of the popliteal space in the interval between the semimembranosus muscle and the medial head of the gastrocnemius muscle and is intimately attached to the posterior capsule of the knee joint and its bordering muscles. It may communicate with the knee joint by a small opening. Its anatomy has been well described by Wilson.¹

Semimembranosus bursitis is not common. Wilson reported 21 cases from the Hospital for Special Surgery, and Meyerding and Van Demark² 15 cases from the Mayo Clinic.

Some, as Meyerding and Van Demark, state that enlargement of this bursa is not caused by trauma and is often associated with rheumatoid arthritis or osteoarthritis. Were arthritic association significant, it would be seen more often.

This report shows the clinical association by common trauma of the enlarged semimembranosus bursa and the torn internal meniscus of the knee joint. This association is not recorded in the literature dealing with semimembranosus bursitis. It has significant medico-legal import. I have operated on 3 patients in whom both the semimembranosus bursa and the torn internal meniscus were removed at the same time. A fourth patient was seen in whom a strain of the anteromedial part of the knee with questionable meniscal tear was associated with bursal enlargement. In this case only the bursa was removed.

REPORT OF CASES

The cases are briefly recorded:

CASE 1.—A man aged 38 jumped from the fender of a truck 3 feet to the ground, twisting his right knee inwardly. Since then he had had a limp, pain on the inner side of the knee and a swelling back of the knee. His knee was asymptomatic

1. Wilson, P. D.; Eyre-Brook, A. L., and Francis, J. D.: A Clinical and Anatomic Study of the Semimembranosus Bursa in Relation to Popliteal Cyst, *J. Bone & Joint Surg.* 20: 963 (Oct.) 1938.

2. Meyerding, H. W., and Van Demark, N. E.: Posterior Hernia of the Knee (Baker's Cyst, Popliteal Cyst, Semimembranosus Bursitis, Medial Gastrocnemius Bursitis and Popliteal Bursitis), *J. A. M. A.* 122: 858 (July 24) 1943.

before the accident. He noted the swelling of the popliteal space four days after twisting his knee. The knee joint had not locked.

He walked with a slight right knee limp. Tenderness was present over the medial joint space and over the internal lateral ligament. A tender bursal swelling $1\frac{1}{2}$ inches long and 1 inch wide was seen posteromedially. Motions of the knee were full.

A diagnosis of semimembranosus bursitis and associated strain of the internal lateral ligament with questionable meniscal injury was made. The bursa was excised on June 11, 1943, about five weeks after the date of injury. His convalescence was not eventful.

CASE 2.—A man aged 29 put his right knee out of joint on March 1, 1938 as he squatted to look under his truck. He had immediate pain on the inner side of the knee and could not extend it or bear weight on it. He heard a snap in the knee as it became locked and felt as if something blocked extension. This was the fifth locking, the first occurring on Dec. 2, 1937, when his right foot slipped on a piece of fat as he was lifting a hind of beef. The knee twisted inwardly. A snap was heard and the knee locked for a few minutes, being unlocked by extension. The interim lockings lasted one-half to one hour.

He walked with an obvious right knee limp. Extension was 170 degrees and flexion was full. The joint was stable laterally but there was slight anteroposterior instability by relaxation of the crucial ligaments. Tenderness and swelling were present over the internal joint space, and the abduction-external rotation test gave pain on the inner side of the knee. A small cyst was palpated posteriorly and medially a week after the first examination on March 5, 1943. He did know that he had it.

On March 14 the internal meniscus (bucket handle tear) and the enlarged semimembranosus bursa were removed. The post-operative course was complicated by a tourniquet palsy of the sciatic nerve, for which neurolysis of the nerve was done on May 3, 1938. He made an excellent recovery.

CASE 3.—A man aged 42 fell six steps on March 3, 1942 while carrying a carton of paper weighing 50 pounds. His right knee twisted inwardly and he landed on both hands. He noted a swelling back of the knee soon after injury. The knee was sore and occasionally swollen on its inner side. He stated that the knee snapped out of place at inconstant intervals, something slipping in the inner side of the joint. This locking was transitory and reduced by shaking the knee into place. He had no trouble with the knee before this accident.

The knee was tender over the internal lateral ligament. Extension was full although he had torn the rectus femoris muscle, but flexion was 15 degrees less than full. No effusion was present. A semimembranosus bursa $1\frac{1}{4}$ inches long and 1 inch wide was felt in the posterolateral part of the popliteal space.

He was reexamined about three to four weeks later. He stated that he could not extend his right knee and that something was blocking extension. He heard a snap on the inner side of the joint and also in the back of the knee when he inadvertently placed the knee in an awkward position. The bursal swelling had varied in size, being larger after use of the knee.

The knee extended to 175 degrees and the internal joint space was tender. The bursa was a little smaller.

On May 4, 1942 the bursa and the internal meniscus were removed. The meniscus was not loose or torn but was thickened anteriorly at the site of asbestos or silvery degeneration. The internal fat pad was slightly enlarged.

Sections of the meniscus showed nothing unusual. The cyst was thin walled and multilocular, and in areas degeneration of the cyst wall was seen.

His recovery was good.

CASE 4.—A man aged 42 caught the toe of his right shoe in a floor depression July 9, 1943 so that, as he fell forward, he twisted his right knee. He struck the anterior part of the knee against the floor. The knee could not be extended, and over a period of two to three weeks it caught many times as something slipped on the inner side of the joint. The knee had been painful and swollen.

He walked with a pronounced right knee limp. The knee extended to 170 degrees and flexed to 10 degrees less than full. Tenderness was noted over the internal joint space and over the internal lateral ligament. The semimembranosus bursa was enlarged.

His condition remained unchanged except that the bursa fluctuated in size, being sometimes so small that it was difficult to palpate it. Operation on July 31 showed that the meniscus had been torn longitudinally along its inner border, the meniscal flap causing the repeated catching of the knee. The meniscus was also fragmented in the horizontal plane. There was a small amount of fluid in the joint. The bursa contained a small amount of fluid and did not communicate with the joint. It was not greatly enlarged. The meniscus and bursa were removed.

He is making an uneventful convalescence.

COMMENT

The trauma which tears the internal meniscus may also cause a semimembranosus bursitis. This is a significant association, emphasizing the need to examine the back of the knee in every case of its injury. The enlargement of the bursa may be occult or obvious, and the swelling may fluctuate in size. This may be due to passage of bursal fluid into the joint and vice versa, but it is more likely an expression of secretory and absorptive power of the bursal wall. The bursa may become fibrotic and no longer palpable. This was seen in one patient in whom only the bursa was involved. The two conditions are, however, separate entities though created by similar trauma. The associated injuries noted were strain of the internal lateral ligament in all cases, relaxation of the anterior crucial ligament in one and rupture of the rectus femoris in another. No patient was arthritic, and the trauma was clear and decisive in the production of the resultant injuries.

The significant popliteal cyst is the enlarged semimembranosus bursa, and the confusing patronym of Baker's cyst should be dropped. Trauma plays an important part in its enlargement. While the patients whom I described were all male adults in the prime period of life, I have seen this bursal enlargement in childhood and in older people. Certainly the bursa may be diseased in arthritis, but it is not a common association.

114 East Fifty-Fourth Street.

The First Hospital in America.—The first hospital in America was established by Cortez in the city of Mexico about 1524. The French established hospitals as early as 1639 in Quebec and Montreal in 1644. It is said that a hospital was opened on Manhattan Island in 1663. Many of these hospitals have had an interrupted operation to the present and their descendants have carried on in some sort of way, but hospitals in America did not really begin until the next century. The Pennsylvania Hospital (1751-56), the Philadelphia Dispensary (1786), the New York Dispensary (1791-95) and the New York Hospital (1791) are the first hospitals that can claim consecutive and successful operation from their foundation. The present Bellevue Hospital began as a room for the sick of the Public Workhouse in 1736; it moved to a new building in 1796 and became a real hospital in 1816. In 1869 it established the first city ambulance service in the world. The Massachusetts General Hospital and the MacLean Hospital for the Insane were established in Boston in 1813. There are now 6,807 hospitals in the United States with 853,378 beds and 671,832 patients.—*The Hospital in Modern Society*, edited by Arthur C. Bachmeyer and Gerhard Hartman, New York, Commonwealth Fund, 1943.

Clinical Notes, Suggestions and New Instruments

A TREATMENT OF PILONIDAL CYSTS AND SINUSES A MODIFIED METHOD OF CLOSURE

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The high incidence of pilonidal cysts and sinuses found in inductees of the United States Army has aroused widespread interest in this condition. In a basic training center new inductees receive vigorous physical training, and this conditioning is prone to irritate preexisting pilonidal cysts and sinuses. In the recent literature there have been numerous descriptions of the treatment of this defect by both primary and partial closure. This brief report does not describe a new operative method but

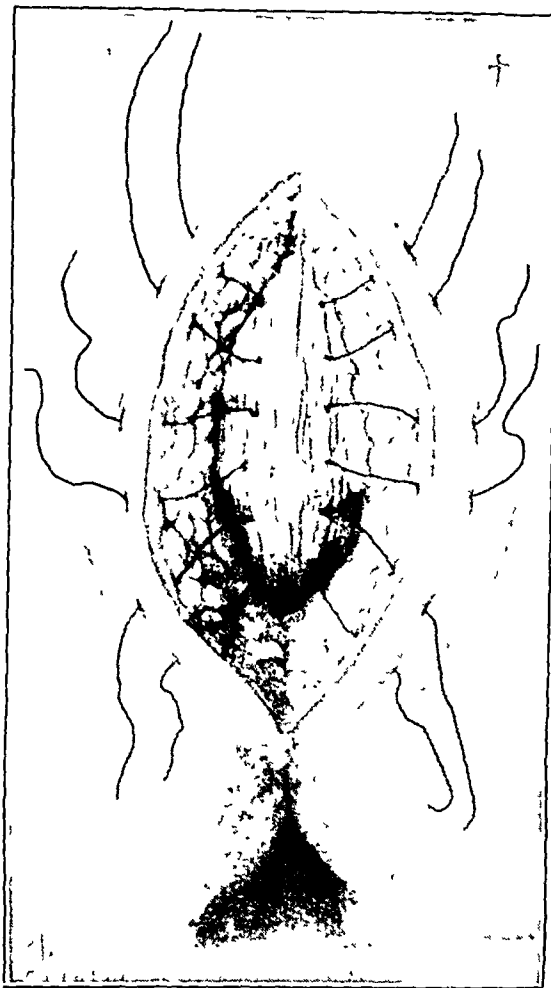


Fig. 1.—Cyst excised; sutures in place.

is an attempt to contribute to the evidence in favor of partial closure of these wounds.

There is need for a procedure which requires as short a hospital stay as possible and which will result in a firm stable scar. Our duty as Army surgeons is to repair physical defects to the best of our ability and to return the soldier to duty as soon as possible. Numerous primary or partial closure methods have been described by Cohn,¹ MacFee,² Woldenberg³ and Bacon.⁴ Kooistra⁵ has recently reviewed the etiology and symptomatology as well as the treatment of this condition. The type of closure described in the present report varies somewhat from these methods and has given gratifying results.

From the Surgical Service of the Station Hospital, Basic Training Center No. 7, Army Air Forces Training Command, Atlantic City, N. J.

1. Cohn, Isadore J.: *Am. J. Surg.* 60:61 (April) 1943.
2. MacFee, W. F.: *Ann. Surg.* 116:687 (Nov.) 1942.
3. Woldenberg, S. C., and Sharpe, W. S.: *Surg., Gynec. & Obst.* 76:164 (Feb.) 1943.
4. Bacon, Harry: Personal communication to the authors.
5. Kooistra, Henry P.: *Am. J. Surg.* 55:3 (Jan.) 1942.

The first 37 cases at this station hospital were treated by either primary closure or excision with subsequent packing of the open wound, depending on the judgment of the operating surgeon. The primary closure method did not prove satisfactory and its use was discontinued. When the wound was packed open, better results were obtained but required a period of hospitalization of from eight to sixteen weeks. Treatment of the cysts by the use of Carnoy's or other sclerosing solutions was not attempted. The present method of treatment was then adopted and this has been carried out in the last 52 cases with a resulting shorter hospital period and more satisfactory healing of the wound. In this series of 52 cases a previous excision had been done in 4, or 7.6 per cent; previous excision and drainage had been done in 17, or 32.3 per cent.

PRELIMINARY TREATMENT

When a patient is admitted to the hospital, a careful examination is made to determine whether or not infection is present. Infected patients are placed on a schedule of hot sitz baths two or three times daily until all signs of the infection disappear or until fluctuation develops. If an abscess forms, a simple incision and drainage is done and the patient is permitted to return to duty as soon as the acute symptoms have subsided. Approximately two weeks after drainage ceases or all inflammation has subsided, the patient is readmitted for excision of the sinus tracts. It was noted in this series that those patients who were operated on immediately after infection subsided required a longer hospital stay before complete healing occurred.

METHOD OF TREATMENT

A cleansing enema is given the night before the operation and repeated the following morning. Nitrous oxide-oxygen anesthesia is usually employed. The patient is placed on the operating table in the prone position with a pillow under the pelvis and the head and foot of the table depressed. The buttocks are not strapped apart, for it is our impression that this distorts the soft tissues in the area to be excised with exaggera-

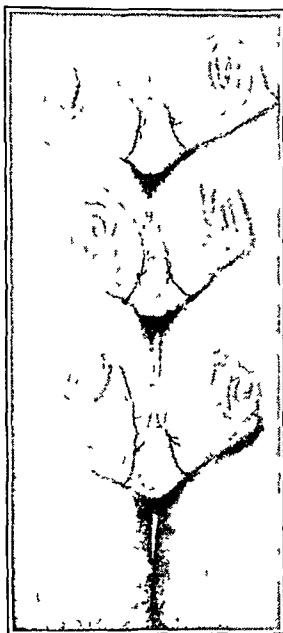


Fig. 2—Incision with sutures in place and tied.

tion of the defect after the adhesive tape is removed. We no longer use methylene blue or other dyes to outline the sinuses, but a probe is inserted into the sinuses to determine their direction and depth and to give an estimate of the area to be excised. An elliptic excision is used, and the skin and subcutaneous fat are removed in one block down to the sacrococcygeal fascia. Careful dissection permits one to distinguish the dirty gray appearance of the cyst wall as well as the sinus connected with it. Hemostasis is secured largely by compression, and it is seldom necessary to ligate bleeding vessels. Only occasionally is it found necessary to use a ligature for hemostatic purposes in the inferior angle of the incision. The skin edges or the subcutaneous tissues are not undermined, and the margin of the skin is attached to the sacrococcygeal fascia by interrupted mattress sutures, using number 18 silk suture as shown in the illustration. No attempt is made to approximate the skin in the midline, and every effort is made to avoid all tension, leaving an open area between the skin edges, which may vary from 0.2 to 1 cm. in width. The interrupted sutures are tied over a roll of gauze moistened with azochloramid tincture placed over the incision and covered by a snug dressing reinforced by adhesive tape. The patient is allowed to assume any position in bed that he desires. An attempt is made to prevent bowel movements for a period of four to five days by the use of camphorated tincture of opium. It was found that this is most desirable in the immediate postoperative period in order to avoid contamination of the wound and subsequent delayed healing. The sutures are removed on the sixth to ninth postoperative day and the patient is permitted to be up and about. The wounds are dressed daily either with boric acid powder or, if a defect is present, with scarlet red ointment to encourage epithelization. The patient is placed on graduated exercise beginning on the tenth postoperative day to encourage firm healing of the wound before returning to his vigorous basic training program.

RESULTS

Fifty-two cases have been treated by this method with an average hospital stay of only 22.6 days. This compares most favorably with the previous series of 37 cases in which primary skin closure or excision with packing was done, with an average hospital stay of 68.4 days. By the adoption of the method described, it may be seen that the average hospital stay has been shortened approximately 46 days, which represents a saving of 2,392 days of hospitalization. Unfortunately it is impossible to follow these patients for a suitable period of time, since the men are transferred to other posts as soon as their basic training is completed. Careful follow-up of patients operated on during their stay at the post revealed that only 5 (9 per cent) had to return to the outpatient clinic for dressing. These cases all healed subsequently.

We have found that the method described gives a fair approximation of the skin margins without interference with drainage, and the wound heals almost as rapidly as when closed by primary suture. From a military standpoint it is valuable in that it permits a soldier to return to full duty in a relatively short period of time.

EASY AND ACCURATE METHOD FOR DETERMINATION OF BLOOD SULFONAMIDES FROM ONE DROP OF BLOOD FROM THE FINGER TIP

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The general practitioner has to know, during the treatment of his patient with sulfonamides, the blood level of this drug, if higher doses are given. In smaller towns, where no help of larger laboratories is available, the physician needs urgently an easy and accurate method for the determination of blood sulfonamides. Nearly each pathologic conference room has been the scene of the result of a fatal intoxication due to uncontrolled use of sulfonamides. For the general practitioner the diazotization method of Bratton and Marshall,¹ which is almost exclusively used in larger laboratories, cannot be recommended. It is for various reasons trustworthy only in hands well trained by daily exercise in examinations of this kind. But even in well trained hands the sources for mistakes are much more numerous than with the method described in this article. This method is based on a discovery of Kuhnau² in 1938. He found

Dr. Edgar Hull, professor of medicine, gave the use of his laboratory, and Mr. C. Adams assisted in working out certain details of the method.
1. Bratton, A. C., and Marshall, E. K., Jr. *J. Biol. Chem.* 128: 537 (May) 1939.
2. Kuhnau, W. W.: *Klin. Wchnschr.* 17: 116 (Jan 22) 1938.

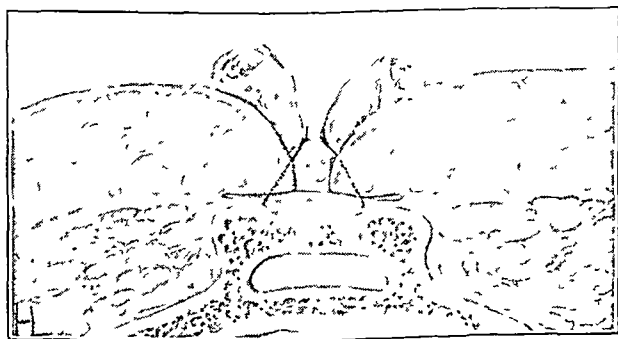


Fig. 3—Cross section of individual suture, tied

tion of the defect after the adhesive tape is removed. We no longer use methylene blue or other dyes to outline the sinuses, but a probe is inserted into the sinuses to determine their direction and depth and to give an estimate of the area to be excised. An elliptic excision is used, and the skin and subcutaneous fat are removed in one block down to the sacrococcygeal fascia. Careful dissection permits one to distinguish

that Ehrlich's paradimethyl-amino-benzaldehyde, the well known reagent for urobilinogen, produced a yellow dye if added to sulfonamides. The dye is a Schiff base (a base containing the radical $-N=CH-$), namely paradimethyl-amino-benzylidene sulfanilamide, if produced by combination with sulfanilamide. This color reaction is certainly not less, perhaps even more sensitive than Bratton and Marshall's ethylenediamine, which replaces at present the previously recommended naphthylamine as coupling reagent for the diazotization. The reason that Bratton and Marshall's method could hold its own in nearly all laboratories against methods which used Ehrlich's reagent is that these methods yielded, according to laboratory directors, not sufficient simplification, compared with the first mentioned method, or they were completely unreliable because of unsuitable simplifications. This last remark is applicable to Fuller's method.³ This method was tried carefully according to the directions. It was found that the commercial tartrazine, with which the test paper has to be colored, may give tints of yellow so different from the yellow color produced by the combination of blood sulfonamides and Ehrlich's reagent that a comparison was impossible. Monto's method⁴ is much better, but it has the disadvantage that it requires an accurate buffer solution of pH 1.4, which makes the method unsuitable for the general practitioner. Churg⁵ showed that alcohol creates a zone around the point of maximum color intensity in which changes in acidity have practically no effect on the intensity of the yellow color. Moreover, alcohol increases the intensity of the yellow color to such an extent that Ehrlich's reagent may detect 1 part of a sulfonamide in 20 million parts of fluid, probably surpassing in this respect all other reagents for sulfonamides. Churg showed in a series of 100 blood sulfonamide examinations that the method with Ehrlich's reagent, accurately performed, gave practically the same results as Bratton and Marshall's ethylenediamine method. It was considered superfluous to repeat these comparisons. The control of the method with Ehrlich's reagent by adding known quantities of sulfonamides to the blood and then determining these quantities is, according to several investigators, impossible. It seems that a small part of the added sulfonamide, varying with different blood specimens, is bound in compound that cannot be detected by the Bratton-Marshall method or by the methods with Ehrlich's reagent. There is no danger that the blood urobilinogen interferes in a degree of practical significance with the result because the color produced by Ehrlich's reagent with urobilinogen is fifty times weaker than that with sulfonamides, according to Churg. Moreover, the quantities of urobilinogen in blood are small compared with the quantities of sulfonamides in blood after the administration of the usual therapeutic doses. Determination of the urine sulfonamides is less reliable because of the presence of oxidation products of sulfonamides.

Bodansky⁶ advises that in practice only the free sulfonamides be determined because only the quantity of the free drug has clinical importance. It takes only a little more time to hydrolyze the conjugated acetyl compound, but it seems better not to determine the conjugated portion, unless requested, because too often confusion results with the two figures to the detriment of the patient. Methods for the separation of the sulfonamides from certain compounds (for instance succinylsulfathiazole) will not be discussed here, because they are described in several handbooks.

Before it was decided to work out a micro method with Ehrlich's reagent, Churg's method was tried, which, compared with its predecessors, has many advantages. The method, using sulfanilamide standards, requires, up to now, according to the description, 1 cc. of blood and has therefore to be considered as a macro method, as are all methods which use more than one drop of blood. According to experience the general practitioner prefers methods which can be performed with one drop of blood. They are less disagreeable for his patients. With Churg's method one has the choice of using either eleven standards made from sulfanilamide, which are to be replaced every

three or four weeks, or standards composed of mixtures of potassium dichromate and potassium chromate, which last much longer. The author undoubtedly felt that the time consuming preparation of not less than eleven standards of sulfonamides was impractical. Certainly this must be admitted for the general practitioner. Experience with the dichromate-chromate standards demonstrates that their colors do not correspond close enough with the colors of sulfonamide plus Ehrlich's reagent to allow accurate readings.^{6a}

In view of these facts an attempt was made to determine whether it would be possible to simplify the existing methods and especially to elaborate a reliable micro method. This purpose is reached in the method described here. Compared with Bratton and Marshall's diazotization method and its important modification, described by Goth, the advantages are obvious. The method requires fewer reagents and the developed color is much more stable, which diminishes the sources of error. The readings often remained constant for two days, provided the tubes were kept in the dark. Beer's law is not applicable on the developed colored substance. However, it is applicable within limits of 0.5 mg. per hundred cubic centimeters if a dilution of the uncolored filtrate is made before the addition of Ehrlich's reagent.

METHOD

Principle.—A fourth of a cubic centimeter of blood is mixed with saponin and trichloroacetic acid. This mixture is filtered, and to the filtrate is added Ehrlich's reagent. A yellow color will appear immediately if a sulfonamide is present in the blood in a quantity of more than 0.5 mg. per hundred cubic centimeters. The yellow color is compared with the colors of four standards.

Reagents.—1. Aqueous solution of 50 mg. of saponin in 100 cc. of distilled water.

2. Twenty per cent aqueous solution of trichloroacetic acid.

3. Two per cent solution of pure Ehrlich's paradimethyl-amino-benzaldehyde in 95 per cent alcohol. It must be stored in a glass stoppered brown bottle. It remains colorless for a long period of time but should be discarded if it becomes yellow. If only a slight yellow color develops in the presence of an acid, the reagent is still satisfactory.

4. A few powders containing accurately weighed 100 mg. portions of sulfanilamide in each. From one of these powders a stock standard solution is made by dissolving it in 100 cc. of distilled water. This solution, placed in an ice box, will keep for several months. In the preparation of the standards a 10 mg. solution of sulfanilamide per hundred cubic centimeters is prepared by diluting 2 cc. of the stock standard to 20 cc. with distilled water. From this 10 mg. per hundred cubic centimeter solution four solutions are prepared:

Seven mg. per hundred cubic centimeters. Add 3 cc. of distilled water to 7 cc. of 10 mg. per hundred cubic centimeter solution.

Five mg. per hundred cubic centimeters. Add 5 cc. of distilled water to 5 cc. of 10 mg. per hundred cubic centimeter solution.

Three mg. per hundred cubic centimeters. Add 7 cc. of distilled water to 3 cc. of 10 mg. per hundred cubic centimeter solution.

One mg. per hundred cubic centimeters. Add 9 cc. of distilled water to 1 cc. of 10 mg. per hundred cubic centimeter solution.

From these four solutions the four standards are prepared as follows: Of each of these solutions 0.25 cc. is placed in each of four tubes. To each tube 4 cc. of the saponin solution and 4 cc. of trichloroacetic acid solution is added. Filtration is necessary only if there is the slightest cloudiness. Into each of four other very clean tubes, having the same diameter as has the "unknown" tube, is transferred 4 cc. of the mixtures and 2 cc. of Ehrlich's reagent. These four tubes are placed in the colorimeter. These standards keep well in an ice box certainly for two weeks.

5. A simple so-called "tube support" for color comparison. It is a piece of wood with seven holes, so that the tube with

3. Fuller, A. T.: *Lancet* 1:760 (June 27) 1942.

4. Monto, R. W.: *Am. J. Clin. Path., Tech. Supp.* 5:165 (Nov.) 1941.

5. Churg, Jacob, and Lehr, David: *Am. J. Clin. Path., Tech. Supp.* 6:22 (March) 1942.

6. Bodansky, Meyer: *Am. J. Clin. Path., Tech. Supp.* 4:151 (Nov.) 1940.

6a. These objections hold also in the case of certain equipment put on the market after this article was written.

7. Goth, A.: *J. Lab. & Clin. Med.* 27:827 (March) 1942.

the unknown can be placed between any two standard tubes. A light blue glass is used as a background at the openings in the colorimeter, because some eyes can distinguish slight color differences in yellow-blue better than in yellow. Duboscq types of colorimeters and a photoelectric colorimeter may be used.

Procedure.—Take with an adequate pipet 0.25 cc. of blood from an ear lobe or finger tip. If oxalated venous blood is available for other examinations, one may use this blood. Blow the blood out in a small mortar. Add 4 cc. of saponin solution. Rub with a pestle and wait four minutes (for hemolysis). Add 4 cc. of trichloroacetic acid solution. Rub again with the pestle. Filter through a retentive filter (No. 5 Whatman) of about 6 cm. diameter. Transfer 4 cc. of the filtrate in a very clean tube. Add 2 cc. of Ehrlich's reagent. Put the tube in the colorimeter. Compare with the standards. If the color of the unknown is more intense than the standard of 7 mg. per hundred cubic centimeters take 1 cc. of the filtrate, dilute it four times (by adding 3 cc. of distilled water). Treat this solution just as the undiluted filtrate. The result of the reading is multiplied by 4.

Conversion Factors.—These are factors by which the reading must be multiplied if sulfonamides other than sulfanilamide are used. The conversion factor for sulfathiazole is 1.7 and for sulfadiazine 1.5. For other sulfonamides which survive the crucial clinical tests, one may calculate the conversion factor as follows. Because the solubility in water of the sulfonamides differs widely, it is advisable to make a 5 per cent solution from the new sulfonamide. Up to the present this has been possible with all sulfonamides. For example, in 100 cc. of distilled water at 37.5 C. the solubility of the free drug is 1,370 mg. of sulfanilamide, 92 mg. of sulfathiazole and 11 mg. of sulfadiazine.

Procedure.—Take three tubes. In the first tube put 5 cc. of a 5 mg. per hundred cubic centimeter solution of the new sulfonamide. In the second tube put 3 cc. of the 5 mg. per hundred cubic centimeter solution plus 2 cc. of distilled water. In the third tube put 1 cc. of the 5 mg. per hundred cubic centimeter solution plus 4 cc. of distilled water; 0.25 cc. of each tube is treated just as the blood filtrate. Compare the standards. Example: The color developed by a 3 mg. per hundred cubic centimeter solution of sulfadiazine corresponds with the color of a 2 mg. per hundred cubic centimeter solution of sulfanilamide. Therefore the conversion factor is 1.5.

SUMMARY

For this micro method with Ehrlich's reagent for the determination of sulfonamides in the blood, one drop of blood is sufficient for analysis. It requires less than half the number of standards used with other reliable methods dependent on Ehrlich's reagent. Moreover, it requires only one reagent; that is, two reagents less than are used in Bratton-Marshall's method. The stain which has to be compared with standards changes much more rapidly in Bratton-Marshall's method than in the methods using Ehrlich's reagent. This property makes the latter method much more reliable in less trained hands. The method can be performed easily and accurately by the general practitioner.

2231 Canal Street.

Invention of the Modern Thermometer.—Even before the invention of the modern thermometer, attempts had been made to estimate the temperature of the human body. In the seventeenth century Santorio Santorio had used a bulb filled with air and opening into a tube. The other end of the tube opened under the surface of some water in a vessel. He placed the bulb inside a person's mouth and the air inside expanded as it became warm and issued in bubbles through the water. By counting these bubbles he could gain some idea of the "hotness" of the person in question. This was an extremely rough and ready method, but it was not until almost two hundred years later that the researches of the physicists, notably Helmholtz and Sir William Thomson (Lord Kelvin), improved the thermometer and placed thermometry on a sound basis.—Haagensen, C. D., and Lloyd, Wyndham E. B.: *A Hundred Years of Medicine*, New York, Sheridan House, Inc., 1943.

Special Article

AMERICAN HEALTH RESORTS

ECONOMIC ASPECTS OF HEALTH RESORT THERAPY

A. M. SIMONS

CHICAGO

These special articles on spa therapy and American health resorts were prepared under the direction of the Committee on American Health Resorts. The opinions expressed are those of the authors and do not necessarily reflect the opinion of the committee. These articles may be published later as a Handbook on Health Resorts.

Value is the basic concept in economics. The question arises as to just what are the values of health resort therapy. The definition and treatment of value in the economics of industry and trade differ widely from those in the economics of medicine. In traditional or "classic" economics value is based on "utility," which is defined as follows in an American textbook on economics:¹

The term utility does not connote any ethical worth. Opium has economic utility as well as bread. Vice has economic utility as well as virtue. The test of economic utility is strictly that somebody wants the good. Whether the want be good or bad, it equally reflects the economic utility of the good. Utility is strictly neutral on the moral aspects of want satisfaction.

The medical profession has always had an entirely different idea of value. The Oath of Hippocrates says:

I will follow that method of treatment which, according to my ability and judgment, I consider for the benefit of my patients, and abstain from whatever is deleterious and mischievous. I will give no deadly medicine to any one if asked, nor suggest any such counsel.

To the medical profession, value of any element in medical practice—education, drugs, technic, institutions or organization—depends on its "utility" in preventing, diagnosing or treating disease. Emphasis is laid on what the economist calls "use value" rather than "exchange value." Such things as air, light, water, scenery commonly have very little "exchange value" but much "use value." Lacking the element of scarcity, they cannot be exchanged in the market for money or other "valuable" goods. The economists call them "free goods" and it is significant of health resorts that they depend largely on giving an exchange value to such free goods.

The dual character of health resort management and treatment constantly combines and confuses these two largely contradictory concepts of value. Practically all health resorts (although there are a few outstanding exceptions) involve two factors both of which are undoubtedly of value in the treatment of disease. The recreational "resort" phase must be operated according to the economics and ethics of business; the therapeutic treatment should be ruled by professional ethics and economics. Recreation, amusement, environment, climate, scenery certainly possess real value according to the medical concepts of the word. They do aid in restoring health. Their management, however, is based largely on the classic economic principle that anything is of value for which a monetary demand can be created. Such an economic demand may be based on as faint a

From the Bureau of Medical Economics, American Medical Association, Chicago.

1. Edie, Lionel D.: *Economics: Principles and Problems*. New York, Thomas Y. Crowell Company, 1926, p. 115.

"trace" of actual use value in the medical sense as some of the "traces" of elements in the analyses of mineral waters. It is difficult to adjust these conflicting ideas of value.

The valuation of the mineral waters more nearly conforms to professional standards. Even here there is much confusion with commercial considerations. New complications are introduced when the waters are bottled and their sale becomes a principal source of income. Even where the original water is not "fortified," "condensed" or transformed into a solid "extract" marketed as a powder, as is quite frequently the case, it is difficult to reconcile the conflicting ideas of value and the resulting marketing practice. Spa publicity often assumes that tradition creates therapeutic value or that value is increased by the antiquity of use, for example during Greek and Roman civilization. The publicity for American spas frequently refers to Indian patronage or to visits by Spanish explorers and early settlers. Tradition is further strengthened by reference to patrons belonging to the class that fixes fashion and social mores. The publicity of an American watering place points with pride to its long patronage by the "élite of society."

Such traditions and social sanctions help to give exchange value to otherwise "free goods"—such as climate, scenery and even the mineral waters—when access to these things is restricted. This exchange value must be large to provide and support the expensive equipment required. Hotels must be built, transportation improved, amusement devices constructed and maintained, and these can be operated with financial success only if a demand is created to support the conduct of such equipment. To create such an economic demand from the fraction of the population living sufficiently high incomes to patronize such resorts calls for a large investment, which in turn requires extensive publicity, expensive advertising and efficient solicitation. This selling effort must be directed not only to a restricted income class but, if the health restoring element is to be stressed, to the fraction of this class who are in need, or at least can be convinced that they are in need, of the health restorative facilities of the resort.

The size of the investment and the annual income necessary to sustain that investment is indicated by the fact that nine of the oldest and most highly developed spas in the United States "represent capital investments of approximately \$20,000,000."² The same authority reports that "the average expenditure per person, the estimate being based on inquiry at the spas themselves, was \$350, the total being \$157,500,000." In some European nations the financial developments and publicity necessary for the maintenance of spas have called into existence extensive organizations involving not only the direct management of the spas but transportation lines and government. There have been several proposals for the formation of some such organization in the United States. A report of the Saratoga Springs Commission to the New York legislature says, concerning investments and publicity:

The state has an investment at Saratoga in land, buildings and equipment of approximately \$8,800,000; \$5,600,000 paid for by the state appropriation and \$3,200,000 by the R. F. C. loan. Only a minority of the people are now getting the benefit of the baths and the waters, because there has not been enough money to tell the public in general of the Saratoga Spa.

In a non-revenue producing department savings may be accomplished by the reduction of expense, but where the expenditure of money is required for commercial development, as in the present case, true economy is the expenditure of sufficient moneys for advertising and promotion to produce a profit upon the moneys already spent.

The medical and professional phase of spa operation is closely involved at every point with this business side. Treatment seems to be largely devoted to convalescent and chronic cases. Since there is a decided lack of institutions for the care of the chronic sick and convalescents in this country, the spas may be looked on as filling this very important deficiency.³

There is an economic obstacle to adequate fulfilment of this role by spas. The overwhelming majority of chronic and convalescent patients are not in the income classes from which the majority of present spa patrons come. There are some provisions for the indigent and low income classes at Hot Springs, Ark., and Saratoga Springs, N. Y., but the economic organization of most spas cannot cater to such classes without outside subsidies and important changes in present types of operation.

European spas have made extensive arrangements to cooperate with insurance institutions and to some extent with relief organizations in providing treatment for persons chronically ill and for convalescents among the low income classes. Special arrangements are provided for the care of indigent patients in the bond purchase "contract" signed as a basis of a loan by the Reconstruction Finance Corporation to the Saratoga Springs Authority.

An ever present conflict centers around the question of where the line shall be drawn between the entertainment and medical aspects of a spa. As far as diet, exercise, entertainment, climate and general environment constitute elements in the treatment of disease, medical supervision would seem to be an essential part of the business side of the spa operation. Where the waters and baths are of real therapeutic value it seems to be generally agreed that they should be prescribed by physicians and administered under medical supervision. This supervision cannot be medically effective unless it concerns itself with many of the economic phases of spa management. Although the financial necessity of more extensive publicity than is approved by the medical profession concerning other methods of treatment may be recognized, its quality and general character should conform to the standards fixed for drugs, hospitals and therapeutic appliances.

The Principles of Ethics of the American Medical Association recognizes the distinction drawn. The sentence which declares that "solicitation of patients by physicians as individuals, or collectively in groups by whatsoever name these be called, or by institutions or organizations, whether by circulars or advertisements, or by personal communications is unprofessional" is immediately followed by the statement "This does not prohibit ethical institutions from a legitimate advertisement of location, physical surroundings and special class—if any—of patients accommodated."

This intermingling, and to some extent conflicting, combination of business and medical management undoubtedly makes efficiency in operation more diffi-

2. Report of the Saratoga Springs Commission to the Legislature, p. 51, Albany, J. B. Lyon Company, Printers, 1930.

3. For discussions of the extent of chronic disease and lack of facilities for the care see Boas, Ernst C.: A Community Program for the Care of the Chronic Sick, *Hospitals* 10: 18 (Feb.) 1936. Goldwater, S. S.: The Hospitalization of the Chronically Ill, Welfare Council, New York, 1935; Institutional Care of the Chronically Ill, American Public Welfare Association, Chicago, 1940. Potter, Ellen C.: Care of Chronically Ill in New Jersey, *J. M. Soc. New Jersey* 38: 27 (Jan.) 1941.

cult. This may be one of the reasons why spas seem to have an even more unstable existence than ordinary commercial undertakings. Replies to the questionnaire of the Committee on American Health Resorts brought information of a large percentage of resorts that had been closed, presumably because of financial failure, and many more that did not reply or from which mail was returned because addressees could not be located. Their prosperity seems to depend on a number of fortuitous conditions. They appear to be very sensitive to economic cycles. Catering to the higher income class makes spa treatment largely a luxury and makes the demand for their services what the economist calls highly "elastic." A small change in such a demand within the comparatively narrow range of possible patrons may cause a wide fluctuation in the percentage of services purchased.

Some further observations of the Saratoga Springs Commission apply to this conclusion:

The fiscal year 1938-39 at the State Reservation at Saratoga Springs has very definitely reflected business conditions throughout the country. There was a decline in income from the bath houses from \$189,370.50 in the previous year to \$167,188.85 during the current year. The unusual circumstance associated with this decrease is the fact that it was caused almost entirely by a reduction in the percentage of higher priced treatments given. In the year just ended such extra and higher cost treatments were almost entirely neglected and a greater demand brought out for the plain mineral water baths at lower prices. Thus, the average income per treatment fell from \$1.39 in 1937-38 to \$1.23 in 1938-39. In addition, the number of charity treatments given increased to 24,971, which represented more than 18 per cent of the whole number of treatments. In 1937-38 the 19,482 charity treatments given were 14 per cent of the whole number.

The financial uncertainty is aggravated by the seasonal character of most spas. Many are open for less than half the year and nearly all show pronounced peaks and depressions in a chart of their annual patronage. This, in part, is due to the combination of recreational and medical features. Patronage of the recreational features is naturally higher during the "vacation" months of the year. Many spas owe much of their attraction to climatic conditions which are dependent on the seasons. Treatment of chronic disease is often "optional" and will be postponed to the most convenient and pleasant time.

All of these conditions being subject to wide fluctuations, it is not surprising that their combined effect renders spa operation financially hazardous. Manifestly continuous operation requires a sufficiently high income during profitable operation to offset the losses in the dull periods. Overhead and depreciation increase with wide variation of employment. High labor turnover and sharply fluctuating wages added to the periodic cost of assembling, training and organizing the labor force, which is greater than in a plant with unbroken operation, increase financial instability.

Many of the economic aspects of spa management are closely related to the type of ownership of the sources of the mineral water and the adjacent land. In the United States, with some notable exceptions, mineral springs have been subject to appropriation with their ownership vested in the possessor of the land on which the springs are located. Some economists have defined ownership as "the right to control the actions of others with regard to the object owned." In the cases of mineral springs such ownership would mean the right to control access to the springs and to the use of the water. The exercise of this ownership over the limited

quantity of the water creates the scarcity on which exchange value can be established.

Ownership by government does not seem greatly to affect the character of the publicity used. The financial "guides" and other promotional literature issued by the spas in Germany, France, Great Britain and the Soviet Union reveal the same type of flamboyant adjectives and exaggeration of the climatic, scenic and recreational activities as is found in the advertising of most American spas. All types of such publicity seem to have the same tendency to exploit spa features as panaceas in terms long made familiar by the distributors of nostrums.

Uncertainty as to the specific therapeutic values of not only the waters but still more of the climatic, scenic and recreational features of spas encourages, rather than restricts, exaggeration in advertising their real or supposed healing power. Remedies for this condition are beginning to be applied in the fields of business and medicine. They consist in the establishment and enforcement of standards of value through research and testing. There are undoubtedly great difficulties in the application of these remedies to the values in spa treatment, although these difficulties are not necessarily insurmountable.

There is a growing tendency in this country to extend the sanitary supervision of spas by health departments. This supervision is, however, little different from that exercised over hotels, restaurants, tourist camps, resorts and other institutions the activities of which may directly or indirectly affect the public health.

There are tendencies and trends even now beginning to take shape that indicate the next steps in meeting some of the economic and medical problems of spa management. Steps have already been taken toward the formation of a national association of spas. Most commercial and industrial lines of business have already formed such trade associations and in so doing have followed the pattern of professional associations in adopting some sort of code of ethics governing their relations with one another and the public. Since the business phases of spa management are so closely intertwined with the practice of medicine, it is certain that any such code formed by an association of spas will need to be brought into harmony with the principles of ethics of the medical profession.

535 North Dearborn Street.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

AUSTIN E. SMITH, M.D., Secretary.

METHENAMINE (See New and Nonofficial Remedies, 1943, p. 165).

The following dosage form has been accepted:

WILLIAM R. WARNER & Co., INC., NEW YORK
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SATURDAY, JANUARY 1, 1944

DEATHS OF PHYSICIANS IN 1943

The obituaries of 3,156 physicians were published in *THE JOURNAL* during 1943. The group included 93 women. The American Medical Directory Report Service, including the United States, possessions and Canada, recorded 3,582 deaths. Of this total 189 were Canadians, a group omitted this year from the regular obituary columns. Deducting the Canadians, a total of 237 deaths more is shown in the Report Service than were included in the published notices in *THE JOURNAL*.

The introduction of the accelerated program for medical students during 1942 precludes an attempt at this time to estimate accurately the net increase to the profession. An increase, however, can be assumed. As of August 14 the graduation of 5,223 students had been recorded. The expected annual average total of students to graduate under the three year accelerated program is 7,000, the heaviest total falling in 1943, when two graduations a year launched the program. On Jan. 1, 1944 the estimated physician population of the United States, exclusive of possessions and temporary foreign, was 188,159.

Age.—The average age at death was 65.2 in 1943, as compared with 65.0 in 1942 for 3,211 deaths published in *THE JOURNAL*. Thirty-nine physicians died between the ages of 25 and 29, 49 between 30 and 34, 71 between 35 and 39, 93 between 40 and 44, 126 between 45 and 49, 158 between 50 and 54, 270 between 55 and 59, 396 between 60 and 64, 545 between 65 and 69, 543 between 70 and 74, 371 between 75 and 79, 265 between 80 and 84, 173 between 85 and 89, 46 between 90 and 94, 9 between 95 and 99 and 2 of 100 or over.

Causes.—Heart disease continues to lead the causes of death among physicians. As is customary, when a contributory factor was returned with a primary cause, both conditions were recorded. Coronary thrombosis and occlusion accounted for 598 deaths, of which 218 occurred in the age group 60 to 69. Angina pectoris and other coronary diseases totaled 136, chronic heart valvular disease and rheumatic heart disease 35, sub-

acute bacterial endocarditis (except rheumatic fever) 11, diseases of the myocardium and pericardium 213, and other diseases of the heart 401. Cerebral hemorrhage, thrombosis and embolism were responsible for 397 deaths, arteriosclerosis 200 and cardiovascular diseases 60. Cancer and tumors in various forms accounted for 323 deaths, 129 falling under cancer of the gastrointestinal tract. Chronic nephritis and uremia totaled 136 and acute nephritis 12. Two hundred and eighteen deaths were attributed to pneumonia, of which 6 were virus pneumonia. In the general disease classification, diseases of the circulatory system contributed to 90 deaths, diabetes 46, postoperative complications 38, other diseases of the gastrointestinal tract 36, tuberculosis 33, diseases of the prostate 32, Hodgkin's disease and leukemia 30, diseases of the nervous system 30, cirrhosis of the liver 26, other diseases of the respiratory system 25, pulmonary embolism and thrombosis 21, other diseases of the genitourinary tract 13, peptic ulcer 13, diseases of the gallbladder 12, asthma 12, other diseases of the liver 11, bacteremia, septicemia and pyemia 11, meningitis 11, pernicious anemia 10, peritonitis 9, other diseases of the blood 7, influenza 7, diseases of the brain 7, appendicitis 6, other diseases of the spinal cord 6, abscess 5, chronic arthritis 4, hernia 3, alcoholism 3, encephalitis 3, diseases of the thyroid 2, bronchitis and pleurisy 2, diseases of the bones 2 and other infectious diseases, acute articular rheumatism and Addison's disease 1 each. Senility was reported in 41 deaths, and 6 were classified as ill defined. There were 45 deaths for which no causes were returned. One death each was reported for epidemic hepatitis, glioma of the brain, gout, massive intracerebral hemorrhage due to rupture of an unidentified vessel, amebic dysentery, chronic undulant fever, agranulocytosis, pellagra, drug addiction, acute circulatory collapse following spinal anesthesia, typhus, acromegaly and myasthenia gravis.

Accidental Deaths.—Of 117 accidental deaths, automobile accidents accounted for 41. Falls were involved in 33 deaths, airplane accidents 22, trains 6, burns 6, bullet wounds 4, drowning 2, asphyxiation 1 and drugs 1. Fractures, which were also included under falls, were of the skull, hip and femur, 13 being recorded for the hip alone. There was 1 unexplained fracture. Of the unusual accidents which have been entered under a general classification, 1 physician was killed in a fall from a horse, 1 tripped over a rifle when hunting, 1 died of a skull fracture received during the Detroit race riot and 3 from burns received when they fell asleep while smoking.

Suicides and Homicides.—Forty suicides were recorded. Bullet wounds led in the method selected with 16, poison 7, drugs 5, cut arteries 4, carbon monoxide 2, drowning 2, hanging 2 and illuminating gas 1. One suicide was unexplained. Shooting was the method in the 4 homicides in the civilian group of physicians.

Miscellaneous Positions.—Among the decedents were 253 who had been teachers in medical schools, 150 of whom had reached the professorial rank; there were 5 deans, 1 associate dean, 1 president of a university and 1 teacher in a public school. One hundred and ninety-one had been health officers, 127 members of boards of health, 116 members of boards of education, 66 coroners, 65 mayors, 63 pharmacists, 45 authors, 35 bank presidents, 33 legislators, 24 members of city councils, 20 editors, 11 members of police departments, 9 clergymen, 9 postmasters, 8 missionaries, 8 lawyers, 6 dentists, 3 members of fire departments, 3 judges, 2 justices of the peace, 2 village presidents, and 1 each had been governor, intern, sheriff and alderman. One had been a member of the Austrian army, 1 chief medical officer of the Supreme Bench of Baltimore, 1 vice consul of Argentina, 1 U. S. minister to Liberia, and 1 a commercial flight surgeon.

Of the total of 3,156 physicians, 558 had served in World War I, 62 in the Spanish American War, 7 in the Civil War and 2 each in the Boxer Rebellion (China), the Boer War and the Philippine Insurrection. Thirty-two were members of the U. S. Public Health Service, 26 of the U. S. Army and 17 each of the Navy, Veterans Administration and Indian Service. Four were in the Air Corps. Twenty-seven were classified in the Army Medical Reserve Corps and 57 not on active duty, 21 were listed in the Navy Medical Reserve Corps, 2 not on active duty. Ten were in the Public Health Service Reserve. Fifty-two were classified in the medical corps of the Army of the United States, 11 not on active duty. Thirty-four were reported in the National Guard; 2 Navy men were assigned to the Marine Corps. Thirty-nine had been members of draft boards in World War I and 84 in World War II.

Association Officers.—Among the decedents 1 had been President of the American Medical Association, 3 Vice Presidents, 1 Trustee, 1 member of a council, 1 chairman of a council, 11 section officers, 1 member of the Judicial Council, 2 committee members and 38 members of the House of Delegates. In state medical societies, 45 had been president, 1 president-elect and two secretaries. Two hundred and fifty had been presidents of county medical societies.

Military Service.—Twenty physicians died in action in World War II and 105 while in military service. One, aged 26, who died in the unexplained explosion of the *Escanaba*, was classified as "killed while in military service." One, aged 29, serving with the medical corps of the Royal Army, died in action while serving in the front line during the advance in Egypt. Five died in the Pacific, 9 in the Solomon Islands, including 4 in Guadalcanal, 4 in the North African area, 1 in Sicily and 1 in a torpedoing off the coast of Cape May, N. J. Of 2 merchant marine casualties, both died in torpedoings, 1 in the North Atlantic and 1 off Iceland. Of those killed in action, 8 were between the ages of

25 and 29, 6 between 32 and 34, 1 between 35 and 39, 2 between 40 and 44, 1 between 50 and 54, 1 between 55 and 59, and 1 in the age group 60 to 64. Of those who were classified under military service, 21 died between the ages of 25 and 29, 18 between 30 and 34, 25 between 35 and 39, 15 between 40 and 44, 10 between 45 and 49, 4 between 50 and 54, 6 between 55 and 59, 5 between 60 and 64 and 1 between 65 and 69. Of the deaths in military service, 12 were attributed to coronary thrombosis or occlusion, 7 to heart disease, 1 to cerebral embolism, 5 to bullet wounds, which are also included in 6 recorded suicides, 24 to airplane accidents, 2 to burns, 4 to automobile accidents, 1 to virus pneumonia, 2 to encephalitis, 7 to some form of pneumonia, 1 to alcoholism, 1 in a bomber crash, 2 to homicide, 1 to drowning, 2 to brain tumor, 3 to meningitis, 1 to carcinoma of the brain, 4 to other types of cancer, 2 to malaria and 1 to bacterial endocarditis. The rest were classified under various physical conditions. In 1942 the obituaries of 11 physicians who died in action were published in *THE JOURNAL* and 37 of those who died while in military service. Thus, *THE JOURNAL* notices record 31 physicians who died in action during the two year period 1942-1943 and 142 who died while in military service. *THE JOURNAL* does not believe that the analysis of the military deaths reflects a true picture of the situation as a whole and believes that the group represents a small percentage of those recorded in Washington but not yet released for publication.

The total of 3,156 physicians includes 1 who died in Missouri but who had been a missionary in the Belgian Congo, 1 in Alaska, 1 in Switzerland, 1 in Edmonton, Canada, and 1 in Newfoundland. An editorial entitled "When and How Physicians Die," published in 1903, was the first review of deaths of physicians by *THE JOURNAL*. A total of 1,400 physicians gave a mean average age of death of 58.

ACETYLCHOLINE AND TRANSMISSION OF NERVE IMPULSES

From the work of Loewi, Dale and Cannon it has been generally accepted that liberation of acetylcholine is concerned in the transmission of nerve impulses across peripheral synapses and motor nerve endings. Hence it became essential to study the chemical reactions involved in the synthesis and breakdown of acetylcholine and to measure the rate of these processes in relation to the speed of the electric potential changes accompanying nerve impulses. This demonstration is a practical impossibility in ordinary nerves, which are too small for chemical studies of this nature. The use by Nachmansohn and his group of the large electric organs of certain fishes which are an accumulation of end-plates permitted the study of acetylcholine metabolism and a more accurate analysis of its relation to transmission of the nerve impulses.

This work has now provided evidence that the metabolic mechanisms like those responsible in the muscle for the mechanical energy of contraction act in nerve tissue in the synthesis of acetylcholine and thus provide electric energy of excitation. An enzyme, choline acetylase, necessary for the synthesis of acetylcholine, was extracted by Nachmansohn and Machado¹ from the electric organs and from rat's brain. According to Nachmansohn and his associates² this enzyme requires for its function the presence of adenosine triphosphate, which supplies energy rich phosphate bonds for the metabolic reactions involved in the formation of acetylcholine. As in muscle, adenosine triphosphate is immediately restored by the breakdown of phosphocreatine, which functions as a reservoir of energy. The rephosphorylation of phosphocreatine is then carried on through the oxidation of dextrose or pyruvic acid. An "acetylcholine cycle" was thus envisaged in which the energy necessary for acetylcholine synthesis is probably given by a chain of reactions similar to that elicited in the muscle during breakdown of carbohydrate.

The liberated acetylcholine is quickly controlled by an enzyme, cholinesterase, present everywhere in nervous tissue. Nachmansohn and his associates³ found in the electric organs a striking parallelism between the electric discharge in volts per centimeter and the concentration of cholinesterase. The amount of cholinesterase present was sufficient to hydrolyze several milligrams of acetylcholine in a period of a few milliseconds, in agreement with the hypothesis that acetylcholine liberation might be intimately connected with the rapid transmission of impulses across synapses and nerve endings. Also the energy provided by the breakdown of phosphocreatine and hence for the resynthesis of acetylcholine was shown by Nachmansohn and his associates² to be sufficiently high to account for the electric energy released by the discharges, or impulses, in the electric organs. This parallelism of concentration of cholinesterase or rate of acetylcholine breakdown, and the caloric energy used in the acetylcholine resynthesis, with the electromotive force released during nerve activity, makes it likely that the metabolism of acetylcholine is the determining factor in the propagation of nerve impulses. As the action potentials of the nerve are surface phenomena, the finding of an increased concentration of cholinesterase in the nerve sheaths⁴ and in the nerve endings⁵ points again to a direct link between the generation

of electric potential changes during nerve activity and the hydrolysis of acetylcholine.

There is much evidence that the concentration of cholinesterase is closely related to the neuronal surface area and that the liberation of acetylcholine occurs throughout the nerve pathways, in peripheral or central neurons⁶ in preganglionic or postganglionic fibers⁷ being only quantitatively higher in ganglions, synapses and end-plates in which there is an extensive endarborization of the nerve fibers and consequent increase in neuronal surface. It is, therefore, probable that the same mechanism, acetylcholine liberation, is responsible for the transmission phenomena not only across synapses and neuromuscular plates but along all nerve pathways.

EXPERIMENTAL DIABETES

Attention has been called in these columns¹ to the work by Dunn, Sheehan and McLetchie² on the action of alloxan on the islets of Langerhans in rabbits and rats. The action in rabbits they describe in some detail. They reported that a single intravenous injection of 300 mg. per kilogram would cause a selective and massive necrosis of the islets accompanied by grave disturbances of the sugar metabolism. They also stated that "so far we can say nothing about the possibility of maintaining animals alive after necrosis of the islands, nor have we obtained chronic lesions by any form of prolonged treatment." In the meantime advances of great interest to the study of experimental diabetes by means of alloxan have been recorded.

Brunschwig and his associates,³ who confirmed the results described with respect to rabbits, found that, in the dogs which survived the intravenous injection of alloxan, hyperglycemia was followed by hypoglycemia and then a pronounced hyperglycemia, which was "sustained for two to three weeks." The islet injury in dogs was not as pronounced as in rabbits. In 3 patients with carcinomatosis they injected 220, 400 and 950 mg. per kilogram respectively of alloxan without any subjective disturbances or effect on the sugar or the nonprotein nitrogen level in the blood. In a preliminary report the Baileys⁴ of the Joslin Clinic and the pathologic laboratory of the Harvard Medical School, Boston, confirm the hypoglycemic action of alloxan observed by Jacobs⁵ and by Dunn, Sheehan

1. Nachmansohn, D., and Machado, A. L.: The Formation of Acetylcholine: A New Enzyme, "Choline Acetylase," *J. Neurophysiol.* **6**: 397 (Sept.-Nov.) 1943.

2. Nachmansohn, D.; Cox, R. T.; Coates, C. W., and Machado, A. L.: Action Potential and Enzyme Activity in the Electric Organ of *Electrophorus Electricus*: II. Phosphocreatine as Energy Source of the Action Potential, *J. Neurophysiol.* **6**: 383 (Sept.-Nov.) 1943.

3. Nachmansohn, D.; Cox, R. T.; Coates, C. W., and Machado, A. L.: Action Potential and Enzyme Activity in the Electric Organ of *Electrophorus Electricus* (Linnaeus): I. Choline Esterase and Respiration, *J. Neurophysiol.* **5**: 499 (Nov.) 1942. Nachmansohn and Meyerhof.⁴

4. Nachmansohn, D., and Meyerhof, R.: Relation Between Electrical Changes During Nerve Activity and Concentration of Choline Esterase, *J. Neurophysiol.* **4**: 348 (July) 1941.

5. Marnay, A., and Nachmansohn, D.: Choline Esterase in Voluntary Muscle, *J. Physiol.* **92**: 37 (Feb. 16) 1938.

6. Chang, H. C.; Hsieh, W. M.; Li, T. H., and Lim, R. K. S.: Humoral Transmission of Nerve Impulses at Central Synapses: IV. Liberation of Acetylcholine into the Cerebrospinal Fluid by the Afferent Vagus, *Chinese J. Physiol.* **13**: 153 (May 20) 1938.

7. Lorente de No, R.: Liberation of Acetylcholine by the Superior Cervical Sympathetic Ganglion and the Nodosum Ganglion of the Vagus, *Am. J. Physiol.* **121**: 331 (Feb.) 1938.

1. Experimental Selective Necrosis of the Islands of Langerhans, editorial, *J. A. M. A.* **122**: 676 (July 3) 1943.

2. Dunn, J. S.; Sheehan, H. L., and McLetchie, N. G. B.: Necrosis of the Islets of Langerhans Produced Experimentally, *Lancet* **1**: 484 (April 17) 1943. See also Dunn, J. Shaw; Kirkpatrick, J.; McLetchie, N. G. B., and Telfer, S. V.: Necrosis of the Islets of Langerhans Produced Experimentally, *J. Path. & Bact.* **55**: 245 (July) 1943.

3. Brunschwig, Alexander; Allen, J. G.; Goldner, M. G., and Gomori, G.: Alloxan, *J. A. M. A.* **122**: 966 (July 31) 1943.

4. Bailey, C. C., and Bailey, O. T.: The Production of Diabetes Mellitus in Rabbits with Alloxan, *J. A. M. A.* **122**: 1165 (Aug. 21) 1943.

5. Jacobs, H. R.: Hypoglycemic Action of Alloxan, *Proc. Soc. Exper. Biol. & Med.* **37**: 407 (Nov.) 1937.

and McLetchie² in rabbits; also the necrotic changes in the islets described by the latter investigators. The Baileys found that the hypoglycemia, "if counteracted by repeated injections of dextrose, is followed by the development of symptoms seen in human diabetes, mainly hyperglycemia, glycosuria, polydipsia, polyuria, acetonuria and lipemia." The response to insulin was prompt.

Dunn and McLetchie⁶ report the production of experimental alloxan diabetes in the white rat. Here again a single subcutaneous injection of 300 mg. of alloxan per kilogram caused necrosis of islet cells, with an initial fall in the blood sugar giving way to a pronounced rise. A continuous diabetes was produced in rats by repeated subcutaneous injections of smaller quantities of alloxan; in other words, diabetes can be produced in rats at will by the selective action of alloxan on the islets. The main purpose of this review is to emphasize the importance of these new methods for the experimental study of diabetes mellitus and carbohydrate metabolism.

Current Comment

POSTWAR GRADUATE MEDICAL EDUCATION

Great concern is frequently expressed about the provision of graduate training for thousands of medical officers who will seek such education after the war. Those whose hospital training did not extend beyond the internship will be especially concerned in this need. The responsibility of medical organizations in this matter is larger than the mere provision of the advanced training which returning physicians desire and deserve. Wartime curtailment of training in many fields of learning will leave our nation poorer in human brains and skills and available expert services, entirely apart from casualties. An uncompensated wartime loss of advanced hospital training for thousands of young doctors would reflect itself in a reduced quality of medical care for years after the war. The responsibility here is clearly an obligation not only to the young doctors but to the health and welfare of the nation. The Council on Medical Education and Hospitals has been at work for several months collecting information on postwar educational facilities. It presents a preliminary report elsewhere in this issue. The results to date are heartening; they give promise that the Council will be able at the close of the war to provide a complete printed list of all available educational opportunities. That these will be ample for the needs of returning medical officers is indicated from the present information, provided plans already begun in hundreds of institutions are continued and extended. All institutions are urged to continue their excellent cooperation with the Council in its further studies of this problem.

6. Dunn, J. S., and McLetchie, N. G. B.: Experimental Alloxan Diabetes in the Rat, *Lancet* 2: 384 (Sept. 25) 1943.

AMERICAN MEDICAL DIRECTORY OUT OF PRINT

The extra demand by government agencies and the armed forces has exhausted the supply of the Seventeenth (1942) Edition of the American Medical Directory. An effort is being made to buy back copies of this edition from owners who can spare them. Orders for such copies as can be secured will be filled in the order in which they are received. A Directory will not be published in 1944; possibly the next edition will not be issued until after the war. However, the Trustees will again report the status of the Directory at the meeting of the House of Delegates to be held in June 1944.

FIFTIETH ANNIVERSARY OF JOHNS HOPKINS UNIVERSITY SCHOOL OF MEDICINE

As a testimony to the fiftieth anniversary of the Johns Hopkins University School of Medicine, which opened its doors Oct. 2, 1893, a special bulletin has been published for distribution to friends of the school and to its graduates. The needs of the war effort make impossible a more elaborate celebration of this important event. The bulletin contains a story of the origin of the school of medicine and excellent portraits of those who have held professorships in many departments. One statement deals with the contributions of the school to the war effort. Finally there is a proposal for future development. The distinguished service of the Johns Hopkins University School of Medicine is so widely known by the achievements of its staff and its graduates that there remains only to congratulate all of those who have participated in its progress on having reached a golden anniversary.

VITAMIN B₁ CONTENT OF DEHYDRATED FOODS

A rapid decrease in the thiamine content of stored dehydrated meats and eggs has been reported by numerous investigators. Rice¹ noted that storage deterioration does not take place in a pet food consisting of two parts of meat or meat by-products and one part of a mixture of cracked wheat, ground barley, soya flour, bonemeal, dried skim milk and tomato paste. This suggested the presence of some unknown thiamine stabilizing chemical factor in the cereal-milk-bone mixture. To test this deduction, Rice prepared and stored two samples of dehydrated pork (6 per cent moisture), one sample containing 33 per cent of the cereal-milk-bone mixture, the other being without cereal supplement. After a week of routine warehouse storage (temperature 120 F.) the thiamine content of the unmixed dehydrated pork was reduced to 15 per cent of its original titer, while 74 per cent of the original thiamine titer was still retained in the pork-cereal mixture. Whether or not this retention was due to a vitamin stabilizing chemical factor in the mixed cereals or to physical properties has not yet been determined.

1. Rice, E. E.; Beuk, J. F., and Robinson, H. E.: *Science* 98: 449 (Nov. 19) 1943.

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeons General of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war, and such other information and announcements as will be useful to the medical profession.

POSTWAR GRADUATE MEDICAL EDUCATION

A Preliminary Report by the Council on Medical Education and Hospitals

Thousands of physicians whose hospital training has been interrupted by the call to military service will be seeking advanced training after the war. Therefore the Council on Medical Education and Hospitals has undertaken a study of postwar graduate educational

Table 1.—Distribution of Residencies

Anesthesiology.....	350	Otolaryngology.....	356
Cardiology.....	55	Ophthalmology-otolaryngology	80
Communicable diseases.....	108	Orthopedics.....	297
Dermatology and syphilology..	188	Pathology.....	436
Epilepsy.....	8	Pediatrics.....	474
Fractures.....	60	Physical therapy.....	101
Gynecology.....	188	Radiology.....	427
Obstetrics-gynecology.....	311	Surgery.....	1,089
Obstetrics.....	287	Plastic surgery.....	49
Malignant disease.....	149	Traumatic surgery.....	16
Medicine.....	1,085	Thoracic surgery.....	68
Mentally deficient.....	10	Tuberculosis.....	303
Neurosurgery.....	100	Urology.....	201
Neurology.....	156	Mixed.....	53
Psychiatry.....	519	Others.....	58
Ophthalmology.....	405		
Total.....			8,028

TABLE 2.—Distribution of Postgraduate Courses

Subjects	Number of Courses	Physicians Accommodated
General postgraduate courses.....	21	1,117
Allergy.....	2	..
Anatomy.....	4	25
Anesthesia.....	5	60
Cardiology.....	11	64
Electrocardiography.....	3	24
Dermatology and syphilology.....	5	12
Clinical pathology and bacteriology.....	8	55
Biochemistry.....	3	35
Hematology.....	4	27
Pathology.....	15	114
Obstetrics.....	8	283
Obstetrics-gynecology.....	7	41
Medicine.....	21	459
Gastroenterology.....	5	19
Endocrinology.....	3	10
Malignant diseases.....	1	..
Neurology.....	3	50
Psychiatry.....	13	173
Ophthalmology.....	12	135
Otolaryngology.....	12	140
Orthopedics.....	4	6
Pediatrics.....	18	352
Radiology.....	14	33
Surgery.....	21	342
Proctology.....	2	..
Neurosurgery.....	1	12
Tuberculosis.....	7	62
Urology.....	7	16
Public health.....	8	345
Veneral diseases.....	3	23
Industrial medicine.....	3	142
Aviation medicine.....	2	13
Totals.....	250	4,522

facilities as one of its major responsibilities. A preliminary survey has been instituted to determine all available and potential facilities for advanced training in connection with intern and residency hospitals, undergraduate and graduate medical schools, departments of health, state medical associations and other

agencies interested in graduate or postgraduate medical education.

Information regarding postwar residencies and fellowships, basic medical science instruction, public health education and other postgraduate courses was requested from 1,267 institutions and agencies including 1,041 hospitals approved for intern and residency training. Replies have now been received from 641 hospitals, 55 medical schools, 25 departments of health, 23 state medical associations and 15 special societies and examining boards. The information obtained is most encouraging. It indicates clearly that constructive planning is under way and that institutions are anxious to cooperate to the full limit of their facilities. The Council recognizes that there will be opportunities for the development of additional high grade training programs in institutions that have not yet reached their full educational capacity. However, it does not wish to encourage the organization of new residencies, fellowships and postgraduate courses unless satisfactory facilities can be provided. While the survey is still incomplete, the following observations are of interest.

RESIDENCIES AND FELLOWSHIPS

How many residencies will be required to meet the demands of medical officers seeking advanced training after the war? There are many unknown quantities as regards the duration of hostilities, casualties among medical personnel, rate of demobilization, opportunities for permanent assignment in the Army and Navy, postwar subsidies and other economic factors. It has been estimated, however, that approximately 12,000 graduates of recent years are now serving in the armed forces whose previous training in civilian hospitals did not extend beyond the intern year. Perhaps 6,000 of this group will later seek hospital appointments. In addition there is the possibility that some 2,000 former residents may return to complete their original assignments or establish themselves in other specialties. Thus with a normal civilian complement of 5,500 residents the approved hospitals may be called on to furnish a total of 12,000 or 13,000 residencies in the immediate postwar period.

Can this demand be met?

Under normal conditions the 660 civilian hospitals approved for residency training supply facilities for approximately 5,500 resident physicians. In the present survey 545 hospitals report 8,028 residencies.

It is apparent from these figures that many institutions have almost doubled their educational capacity for postwar training. If this degree of expansion is maintained, it should be possible to develop the required twelve or thirteen thousand residencies in the approved hospitals, especially if the potentialities of the internship hospitals are also taken into consideration.

The distribution of residencies in the present survey is given in table 1.

BASIC MEDICAL SCIENCES

There is evidence in the reports of the medical schools that careful attention is being given to the problem of supplying basic medical science instruction in relation to clinical specialties during the postwar period. Up to the present time 37 schools have indicated that facilities will be available for continued training in the preclinical fields. Twelve hospitals reported affiliations with medical schools to provide supplementary instruction in basic sciences, while 24 others indicated that courses of this type would be developed in their own departments of bacteriology and pathology. From the incomplete information now at hand it is apparent that 117 positions are available in anatomy, 124 in bacteriology, 135 in pathology, 96 in biochemistry and 123 in physiology.

POSTGRADUATE COURSES

Information received from 60 hospitals, 26 medical schools and the various state medical associations and departments of health indicates that 259 postgraduate courses have been organized which can accommodate a minimum of 4,522 physicians. The capacity is obviously much larger than the number indicated, however, for the size of the class was not specified in connection with 133 of the courses listed. The distribution of these educational opportunities is shown in table 2.

This study of postwar educational facilities will be continued so that at the close of the war the Council expects to have ready for distribution a printed list of all educational opportunities available to returning medical officers and especially planned for them. The achievement of this goal will depend in large measure on a continuation of the excellent cooperation of the hundreds of institutions which have been keeping the Council informed of their postwar plans.

ARMY

FLIGHT SURGEONS IN THE SOUTH PACIFIC

Flight surgeons who are to be assigned to various units of the 13th AAF assemblé at headquarters of the Air Force "somewhere in the South Pacific." They are, from left to right: First row: 1st Lieut. Daniel D. Dolce, Buffalo; 1st Lieut. Michael L. Gompertz, New York; Capt. Carl F. Wagner, Cincinnati; 1st Lieut. DeWitt C. Kissel, Pittsburgh; 1st Lieut. William C. Craig, Waynesboro, Pa. Second row: Capt. Law-



Flight surgeons in South Pacific

rence H. Siegel, Dallas, Texas; Capt. Alfred J. Krug, Maplewood, N. J.; Major Raymond H. Vunk, Charleston, S. C. (standing); Capt. Wilbur A. Smith, Philadelphia; 1st Lieut. Edward A. Backus, Milwaukee; 1st Lieut. John L. Meyers, Shillington, Pa. Third row: Capt. Bernard J. Goldman, Detroit; Capt. Bernard L. Kreilkamp, St. Cloud, Minn.; 1st Lieut. Charles E. Cook, North Manchester, Ind.; 1st Lieut. Allen P. Newman, Carleton, Mich.

AWARDED LEGION OF MERIT

The War Department announced on December 18 an award of the Legion of Merit to the following officers of the U. S. Army Medical Corps:

Lieut. Col. William R. Hallaran, formerly of Cleveland, for "exceptionally meritorious conduct in the performance of outstanding services in New Guinea. From Dec. 20, 1942 to Jan. 21, 1943 as surgeon of an advanced base Lieutenant Colonel Hallaran successfully maintained the health of the command by his tireless supervision of malaria control activities and by his

development of field sanitation technics, effectively adapted to the special difficulties encountered by troops operating in the jungle. As commanding officer of a portable hospital from Dec. 20, 1942 to May 11, 1943, under primitive conditions, he operated the hospital and rendered superior service in the treatment of tropical disease cases and numerous serious battle casualties. His exemplary devotion to the improvement of the health and living conditions of the troops raised the morale and personal efficiency of officers and men alike. Lieutenant Colonel Hallaran made a vital contribution to the development of this advanced base." Dr. Hallaran graduated from Western Reserve University School of Medicine, Cleveland, and entered the service Jan. 10, 1942.

Lieut. Col. Alva E. Miller, formerly of St. Louis, was awarded the Legion of Merit for "exceptionally meritorious conduct in the performance of outstanding services in New Guinea from Jan. 21, 1943 to Aug. 12, 1943. As surgeon of an advanced base, Lieutenant Colonel Miller was charged with organizing hospitalization, evacuation, tropical disease control and sanitation. With limited personnel and under adverse conditions of weather and terrain, he progressively lowered the sick rate of the troops, planned the hospitalization in connection with expansion of the base and personally explored the rough terrain for suitable sites. At all times he gave unstintingly of his time and maintained high professional standards. On many occasions of enemy air attack Lieutenant Colonel Miller, often working between bombing runs, personally directed the removal of casualties and gave emergency treatments. His services were an important contribution to the logistic support of the successful combat operations on the north coast of New Guinea." Dr. Miller graduated from Washington University School of Medicine, St. Louis, in 1934. He has been a regular army officer since 1939.

Major (then Captain) George S. Maxfield, formerly of Waco, Texas, was awarded the Legion of Merit for "Exceptionally meritorious conduct in the performance of outstanding service as Chief of x-ray service at Amchitka during the period of Jan. 22, 1943 to Aug. 25, 1943. Under most trying conditions of weather, lack of facilities and little assistance, he rendered excellent services from his department day and night during the initial phase of the landing. In addition to his own duties he volunteered his services and took personal charge of the erection of several buildings of the station hospital. Captain Maxfield set a high example to all men he worked with and through his leadership, energy and high devotion to duty contributed greatly to the development of the medical facilities at his station." Dr. Maxfield graduated from Baylor University College of Medicine, Dallas, Texas, in 1940 and entered the service July 1, 1941.

Major (then Captain) Maurice M. Steinberg, formerly of Omaha, was awarded the Legion of Merit for "Exceptionally meritorious conduct in the performance of outstanding services

in New Guinea from Sept. 2, 1942 to June 9, 1943. Major Steinberg volunteered for service in New Guinea at a time when the security of the island was seriously threatened. Assigned as chief of the Hospitalization and Evacuation Section, Office of the Surgeon, United States Advanced Base, he organized quickly and effectively the facilities for the hospitalization and staging of large numbers of sick and wounded. During the Papuan campaign he regulated the heavy traffic of patients with remarkable precision and speed. Major Steinberg also was largely responsible for the preparation of statistical material on the basis of which many problems of the Medical Department in New Guinea were solved. His technical proficiency, his energy and his executive talent were largely responsible for dealing successfully with a most difficult situation." Dr. Steinberg graduated from Creighton University School of Medicine, Omaha, in 1935 and entered the service Jan. 25, 1941.

THREE ARMY NURSES TO RETIRE

Lieut. Col. Elsie Neff, after serving thirty-three years in the Army Nurse Corps, will retire on March 31, 1944. A graduate of Princeton Sanatorium, Princeton, Ind., she has served in the capacity of chief nurse in widely scattered areas of the United States, saw duty in the Philippines both before and after World War I, and was stationed in Hawaii from 1926 to 1930. Colonel Neff is now principal chief nurse of Fitzsimons General Hospital, Denver, where she has been serving since 1938.

1st Lieut. Christina C. MacLauchlan will retire on Jan. 31, 1944 after twenty-six years in the Army Nurse Corps. Born in Canada, she received her nursing training at the Blackstone Hospital, Pawtucket, R. I., where she graduated in 1916 and became a citizen of the United States in 1920. Joining the Army Nurse Corps in 1918, she served eleven months with Base Hospital No. 60 at Bazoilles-sur-Meuse in France. She served in the Philippine Department from 1927 to 1929 and in the Hawaiian Islands from 1937 to 1939. At the present time she is stationed at Walter Reed General Hospital, Washington, D. C., where she was promoted to the grade of first lieutenant in February 1943.

1st Lieut. Clara W. Woodruff, who has served twenty-five and a half years in the Army Nurse Corps, will retire on Feb. 29, 1944. Graduating from Sayre, Pennsylvania's Peoples' Cooperative Hospital in 1913, she specialized as a laboratory technician, in which branch she has served throughout her career in the army. She joined the Army Nurse Corps in 1918 and served with Base Hospital No. 77 in Beaune, France, for seven months, for which she received the Victoria Medal. Her only other period of overseas service was in the Philippines from 1921 to 1923. She has served in large army general hospitals in the states from coast to coast and was promoted to the grade of chief nurse in 1942. Lieutenant Woodruff is stationed at the Letterman General Hospital, San Francisco.

MAJOR ANTHONY D. D'ALFONSO AWARDED AIR MEDAL

The War Department announced on December 15 the award of an air medal to Major Anthony D. D'Alfonso of the U. S. Army Medical Corps, formerly of Philadelphia, for "Meritorious achievement while participating in aerial missions over the Solomon Islands as a flight surgeon from December 1942 to May 1943. Major D'Alfonso took part in strike and search missions over Munda, Kahili and Rekato Bay areas, acquiring a total of one hundred and fifteen hours in combat operational flights. His vigorous prosecution of his duties as surgeon and his arduous efforts to gain a better understanding of the various combat factors enabled him to cope most intelligently with ailments from combat flying. Major D'Alfonso's sound judgment and devotion to duty contributed immeasurably to the physical well-being of combat crews and elicited the confidence and admiration of his subordinates and superiors. His voluntary actions displayed a fine example of the highest soldierly qualities and are in keeping with the traditions of the United States military service." Dr. D'Alfonso graduated from Hahnemann Medical College and Hospital of Philadelphia in 1939 and entered the service Nov. 8, 1940.

THE WILLIAM BEAUMONT GENERAL HOSPITAL

The William Beaumont General Hospital is one of the six named army general hospitals which were in operation prior to the present war. The hospital was opened on July 1, 1921 and is situated ½ mile north of the limits of the city of El Paso. In 1942, however, a number of new wards and detachment barracks were built, a large additional mess hall was added and a new administration building was completed and occupied late in 1941. The hospital buildings are of hollow tile and stucco. The wards are all of the two story type, connected by covered ramps. The capacity of the hospital at present is 1,750. The professional work done at the hospital is of a general nature, although special emphasis is placed on plastic surgery.

The hospital was named for William Beaumont, the U. S. army surgeon who in 1822 made the first notable contribution to our knowledge of the action of the gastric secretions, which he was enabled to study through a wound of the stomach which failed to heal.

Col. George M. Edwards has been in command of the hospital since May 12, 1937. Other medical officers on the staff are as follows:

ADMINISTRATION

Lieut. Col. Joe H. Sanderlin, executive officer.
Capt. Raymond L. Pendleton, registrar.
Capt. Thomas W. Torgerson, receiving and disposition officer.

SURGICAL SERVICE

Lieut. Col. Granville S. Delamere, chief.
Lieut. Col. John G. Manning, chief, orthopedic section.
Major William A. Bishop, Jr., assistant chief.
Capt. William C. Basom, ward officer.
1st Lieut. Richard C. Stauffer, ward officer.
Major Henry I. Berman, chief, genitourinary section.
1st Lieut. Robert O. Beadles, assistant chief.
Capt. William Dreyfuss, ward officer.
Major William H. Frackelton, chief general and plastic surgery section.
Major Lewis L. Hall, chief, obstetric and women's surgery section.
Capt. Charles Fields, ward officer.
Major Travis M. Martin, assistant chief, surgical service; chief, surgical section.
Harry A. Jakeman, ward officer, general surgery.
Major Oscar W. Thoeny, chief, eye, ear, nose and throat section.
Capt. George A. Filmer, ophthalmologist.
1st Lieut. David Bennett, ward officer.
Capt. Arthur P. Martini, chief, physical medicine and fever therapy section.
Capt. Jacobus D. McCulley, chief, operating room and anesthesia section.
1st Lieut. Dexter R. Branch, assistant chief.

MEDICAL SERVICE

Lieut. Col. George P. Denny, chief.
Lieut. Col. Lee Palmer, assistant chief.
Lieut. Col. George T. McMahon, chief, neuropsychiatric section.
Otto L. Bendheim, ward officer.
Major Joseph Bank, chief, general medicine section.
Capt. Louis J. Cheskin, ward officer.
Capt. John M. Gibbons, ward officer.
1st Lieut. Wayne P. Beardsley, ward officer.
Major Harry D. Clark, chief, pulmonary section; internal medicine.
Major Lester C. Feener, chief, cardiovascular section.
Hugh S. Espey, assistant chief.

LABORATORY SERVICE

Col. Albert G. Kinberger, chief.
Major Lester S. King, assistant.
Major William Reiner-Deutsch, San. Corps, assistant.
Capt. LaMonte A. Tucker, San. Corps, assistant.

DENTAL SERVICE

Major Crawford A. McMurray, D. C., chief.
Capt. Charles J. Bleke, D. C., assistant.
Capt. Raymond M. Davis, D. C., assistant.
Capt. Theodore G. Hollingsworth, D. C., assistant.
Capt. Milton L. Moore, D. C., assistant.
Capt. George H. Spicer, D. C., assistant.
Capt. Joseph E. Spiezo, D. C., assistant.
Capt. Kenneth W. Thomas, D. C., assistant.

X-RAY SERVICE

Major John H. Gilmore, chief.
Capt. Thomas K. Mahan, assistant chief.
1st Lieut. Harry I. Berland, assistant.

OUTPATIENT SERVICE

Lieut. Col. Wray R. Gardner, chief.
Major Maxwell Berman, assistant.
Capt. Clarence Bantin, assistant.

UNDERGROUND HOSPITAL AT CAMP JOSEPH T. ROBINSON

Underground hospitals are being built in some of our camps today so that the soldier, both medical and from other branches, will know exactly what to expect as a casualty overseas or as a medical attendant. Such a hospital, consisting of three wards, has been built at Camp Joseph T. Robinson, Arkansas. This underground hospital (the 55th General Hospital), is a training project and is practically bomb proof. It has been dug and carved from the earth and sandstone of the military terrain. The interior is finished with solid board floors, ceilings and side walls covered with insulation, and electricity and plumbing which is available in the field behind the lines of battle. Each of the three wards, connected by underground passages, is approximately 7 to 9 feet high, by 30 feet long and 15 feet wide. Three tunnels connect the passageways with the outside. Three feet of dirt rock protect the roofs of the wards. The hospital is completely equipped with x-ray equipment, blood plasma banks and the latest resuscitation elements. The hospital has its own electric generator in one of the passageways and running water in each room. Ventilators reaching to the upper ground have been constructed to serve also as emergency exits, and with the use of a "short litter," a metal frame which fits around the back of the patient, casualties can be hoisted to the open air. Lieut. Col. Charles C. Gill is in command at the Camp Joseph T. Robinson Hospital.

LIEUT. CHARLES C. SMITH AWARDED SILVER STAR

Lieut. Charles C. Smith, formerly of Charleston, S. C., has been awarded the Silver Star for gallantry in action. The citation accompanying the award read as follows: "On the 10th of July 1943 the ship on which First Lieutenant Smith was a passenger was bombed and strafed by German planes as it prepared to beach near Licata, Sicily. One halftrack was set afire and Lieutenant Smith directed and personally assisted the fire-fighting crew. He spent the remainder of the day inside the ship caring for the wounded, completely disregarding further bombing and strafing attacks. His calm, courage, absorption

to duty in the face of danger, and above all his coolness under fire, was an inspiration to all army and navy personnel on board and helped immeasurably in the sustaining of a high morale during a difficult operation." Dr. Smith graduated from the Medical College of the State of South Carolina, Charleston, in 1941. He entered the service July 8, 1941 and is now serving with the armored field artillery unit of the Fifth Army in Italy.

PRISONERS OF WAR

Word has recently been received by the wife of Lieut. Orville L. Barks, formerly of Sanford, Fla., that he is a prisoner of war at Oflag 64, Germany, having been captured in Tunisia in February. Dr. Barks graduated from Washington University School of Medicine, St. Louis, in 1938 and entered the service in August 1940.

Information has recently been received that the following medical corps officers are being held prisoners of war in Concentration Camp P. G. 21 in Italy:

Capt. Francis Gallo, formerly of Winsted, Conn., who graduated from Jefferson Medical College of Philadelphia in 1934 and entered the service in April 1941.

Capt. Wilbur E. McKee, formerly of Columbus, Ohio, who graduated from Ohio State University College of Medicine in 1930 and entered the service in May 1941.

Capt. Henry J. Wynsen, formerly of Youngstown, Ohio, who graduated from Loyola University School of Medicine, Chicago, in 1941 and entered the service in September 1941.

Capt. Thomas E. Corcoran, formerly of Rock Rapids, Iowa, who graduated from the State University of Iowa College of Medicine, Iowa City, in 1938 and entered the service in February 1941.

FLIGHT SURGEONS' ASSISTANTS

A class of one hundred flight surgeons' assistants completed the course in aviation medicine at the School of Aviation Medicine, Randolph Field, Texas, November 27. Brig. Gen. Eugen G. Reinartz, U. S. Army, is commandant of the school.

NAVY

MOBILE LABORATORY TO TEST NUTRI- TIVE VALUE OF NAVY MEN'S DIETS

A new mobile unit has been created by the Naval Medical Research Institute, Bethesda, Md., in order to obtain detailed information on field nutrition practices. It is designed to determine accurately the nutritive values of foods used in navy menus as they are served. The mobile nutrition unit consists of a small truck which has been converted to afford facilities for collection and preservation of food samples from mess halls. It is equipped with a quick freezing unit to preserve certain food samples which will be transported to the Naval Medical Research Institute for analysis. Equipment is also provided for the determination of vitamin C content. The first field studies were conducted at Quantico, Va., under the direction of Lieut. Comdr. Clive M. McCay of the Naval Medical Research Institute, who in civilian life is professor of nutrition at Cornell University and lives in Ithaca, N. Y.

CAPT. LOUIS H. RODDIS RECEIVES WELLCOME AWARD

Capt. Louis H. Roddis (MC), U. S. Navy, has received the Sir Henry Wellcome award of 1943 of the Association of Military Surgeons of the United States. Thirteen manuscripts were submitted in competition. Dr. Roddis was the fourth successive naval officer to win this award. He graduated from the University of Minnesota Medical School, Minneapolis, in 1913. He is at present on duty at the Naval Training Station, Newport, R. I. The second award was given to Lieut. Comdr. Samuel G. Berkow (MC), U.S.N.R., Naval Hospital, Norfolk,

Va., who received a life membership in the association. Honorable mention for third place was awarded to Lieut. Col. Roswell K. Brown, M. C., A. U. S., stationed at Stanford University, Calif., and to Capt. Irving M. Artel, 230th Station Hospital, Camp Van Dorn, Mississippi.

WORK OF NAVY MEDICAL CORPS PERSONNEL ON TARAWA

With the aid of three navy medical corpsmen, Lieut. Herman R. Brukart, formerly of Menominee, Mich., is reported to have treated more than 100 men in a "pill box" hospital, with only four casualties, during the first thirty-six hours after marines struck the Japanese Gilbert Islands' bastion. The little pill box hospital was situated directly on the front lines the first two days of the brief but bitter Tarawa fighting. But despite the fact that constant Japanese machine gun bullets thudded in the little doorway, the naval crew refused to relax its efforts to save Leatherneck lives. Many of the marines with slight wounds remained around the pill box for hours helping carry the more seriously wounded in to the doctors.

NAVY PERSONALS

Capt. Joel J. White, Nashville, who served fourteen months in the South Pacific as medical officer in command of Base Hospital No. 3, will assume the duties as medical officer of the Norfolk Navy Yard, replacing Capt. James F. Hooker, who has been detached and assigned to foreign duty. Dr. White, who has been in the United States Navy for twenty-six years, started a branch hospital at Guadalcanal and spent August, September and October 1942 on Guadalcanal. He has received

the Presidential Unit Citation for his task force in the South Pacific with a star indicating engagements, the Victory Medal, the South Pacific Campaign Ribbon with star and the Haitian Legion of Merit and Honor Medal. Dr. White graduated from Vanderbilt University School of Medicine, Nashville, in 1916 and was commissioned a junior grade lieutenant in the United States Navy in 1917.

Comdr. Gordon Bennett Tayloe, formerly of Aulander, N. C., recently left the United States to become head of a hospital unit somewhere in foreign territory. Dr. Tayloe graduated from the University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, in 1927 and on completion of his internship was commissioned in the Navy

Medical Corps. Since that time he has seen service at sea and in hospitals in port cities of Washington, Portsmouth, Long Beach, Brooklyn, Philadelphia and Guam. He escaped from Guam just in time to avoid capture by the Japanese as they closed in on the islands of the Pacific. Since that time he has received special training at the Mayo Clinic and served as head of a naval hospital in Philadelphia before going overseas.

Dr. Joseph H. Barach, medical director of the Falk Clinic at the University of Pittsburgh School of Medicine, was guest speaker at the meeting of the Staff of the United States Naval Hospital at Quantico, Va., November 29. The subject of his address was "Etiologic Factors in the Transition from Mild to Severe or Fatal Diseases."

PROCUREMENT AND ASSIGNMENT SERVICE FOR PHYSICIANS, DENTISTS AND VETERINARIANS

HOSPITALS NEEDING INTERNS AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their Procurement and Assignment Service quotas for the early months of 1944:

(Continuation of list in THE JOURNAL, December 25, p. 1124)

CONNECTICUT

Undercliff, Meriden State Tuberculosis Sanatorium, Meriden. Capacity, 308; admissions, 392. Dr. Cole B. Gibson, Medical Director (resident—tuberculosis).

MINNESOTA

Swedish Hospital, Minneapolis. Capacity, 362; admissions, 10,037. Mr. R. K. Swanson, Superintendent (1 intern).
Bethesda Hospital, St. Paul. Capacity, 200; admissions, 6,369. Rev. L. B. Benson, Superintendent (3 interns).
St. Joseph's Hospital, St. Paul. Capacity, 282; admissions, 9,259. Sister St. Ignatius, R.N., Superintendent (1 intern).

OHIO

Deaconess Hospital, Cincinnati. Capacity, 200; admissions, 5,200. Mr. William F. Frersing, Superintendent (2 interns).
Massillon State Hospital, Massillon. Capacity, 3,420; admissions, 763. Dr. Arthur G. Hyde, Medical Superintendent (assistant resident—psychiatry).
Lucas County General Hospital, Toledo. Capacity, 325; admissions, 3,215. Mr. Robert R. Stewart, Acting Superintendent (2 interns).

PENNSYLVANIA

Mercy Hospital, Pittsburgh. Capacity, 680; admissions, 14,128. Sister Anna Marie, R.N., Superintendent (2 residents).
Mercy Hospital, Wilkes-Barre. Capacity, 220; admissions, 4,586. Sister Mary Avellino, R.N., Superintendent (4 interns).

VIRGINIA

Retreat for the Sick, Richmond. Capacity, 120; admissions, 3,913. Miss Alice T. Collins, R.N., Superintendent (3 residents).

WEST VIRGINIA

Chesapeake and Ohio Hospital, Huntington. Capacity, 185; admissions, 2,900. Miss Eleanor D. Koch, R.N., Superintendent (resident—medicine).

MISCELLANEOUS

WARTIME GRADUATE MEDICAL MEETINGS

Among the subjects scheduled for early presentation under the auspices of the Wartime Graduate Medical Meetings are the following at Indiantown Gap, Pa.: Dermatology, Dr. J. V. Klauder and Lieut. Comdr. H. E. Twining, January 6; Chest Surgery, Dr. J. S. Rodman, January 13; Dysenteries, Dr. H. L. Bockus, January 20; Malaria, Dr. W. Savitz and Comdr. G. W. Smith, January 27.

At Fort Monmouth, N. J.: Gastrointestinal Hemorrhages, Lieut. Comdr. J. T. Eads and Capt. S. B. Lapin, January 5; Dysenteries, H. L. Bockus and Capt. S. B. Lapin, January 12; Psychosomatic Medicine, Dr. B. P. Weiss and Major H. Swire, January 19 and 26.

At the Naval Hospital, Philadelphia: Laboratory Medicine, Dr. J. Eiman and Lieut. Comdr. H. M. Dixon, January 7; Peripheral Vascular Disease, Dr. M. Naide and Lieut. Comdr. G. C. Griffith, January 21.

At Camp Lee, Va.: Psychoneurosis, Maladjustment, Neuro-psychiatry, Dr. O. B. Darden, January 7; Dysenteries, Dr. J. A. Scherer, January 14; Newer Drugs and Their Uses in Practice, Dr. H. B. Haag, January 21; Diagnosis and Treatment of Contagious Diseases, Dr. H. Walker, January 21.

At the U. S. Naval Hospital and the U. S. Naval Academy Dispensary, Annapolis, Md.: Psychoneurosis Among the Armed Forces, Dr. R. H. Guthrie, January 21; Rickettsia, Diagnosis, Treatment and Prevention, Dr. R. E. Dyer, February 18.

ARMY GENERAL PRAISES NAVY DOCTOR

Lieut. Comdr. Henry F. Strongin, formerly of New York City and now stationed at Great Lakes (Ill.), was highly praised by Major Gen. Albert W. Kenner in a personal letter which read as follows: "It was my intention to bring to the attention of the Naval Task Force surgeon the efficient manner in which you administered to our men during the trip across and the

assault phase of our landing at Fedala. You were extremely cooperative with the Army medical personnel and I have no hesitance in stating that because of your efforts our men were in excellent physical condition when they engaged the enemy. Because of the exigencies of combat and the fact that the fleet sailed before I had anticipated, I failed to express my appreciation formally, through official channels." Dr. Strongin graduated from George Washington University School of Medicine, Washington, in 1921 and entered the service on Jan. 22, 1942.

PUBLIC HEALTH UNDER HITLER

DNB of October 6 states that, in order to insure the efficient employment for the members of the medical professions, all doctors, dental surgeons, dispensing chemists, midwives, dentists and dental mechanics admitted to practice who have to leave their place of work or residence because of a terror raid must report without delay to the competent professional organization in accordance with instructions issued by the reich health leader, Dr. Conti, or by their professional organization. It is in the interest of these professionals themselves that they report, since they might otherwise suffer losses.

The October 8 issue of *Le Petit Journal* quotes *Le Petit Dauphinois*: "At least 70 to 80 per cent of children show symptoms of rickets, chiefly due to the inadequate supply of milk. The deficiency of antirickets vitamins could be remedied through ray activated milk costing only a few centimes more per liter, which is not expensive when it is a matter of saving many generations. Unfortunately, a decree of Dec. 22, 1936, promulgated at the Medical Academy's request, practically prohibits a large scale use of ray activated milk. Under this decree, chemists alone may sell such milk, and naturally at prohibitive prices. The government should at once repeal the decree, which is now less justified than ever."

ORGANIZATION SECTION

OFFICIAL NOTES

THE 1944 CHICAGO SESSION

Section Representatives to the Scientific Exhibit

Following is a list of representatives to the Scientific Exhibit from each section of the Scientific Assembly:

- Practice of Medicine—Dr. Thomas C. Garrett, 3803 Oak Road, Germantown, Philadelphia.
- Surgery, General and Abdominal—Col. Grover C. Penberthy, Headquarters Seventh Service Command, Omaha.
- Obstetrics and Gynecology—Dr. Fred H. Falls, University of Illinois College of Medicine, 1853 West Polk Street, Chicago 12.
- Ophthalmology—Dr. Georgiana D. Theobald, 120 Medical Arts Building, Oak Park, Ill., chairman, Section Committee on Scientific Exhibit; Dr. A. B. Reese, New York; Dr. Derrick Vail, Cincinnati.
- Laryngology, Otology and Rhinology—Dr. Paul H. Holinger, 700 North Michigan Avenue, Chicago.
- Pediatrics—Dr. Sterling H. Ashmun, 117 South Main Street, Dayton, Ohio.
- Experimental Medicine and Therapeutics—Dr. Robert W. Wilkins, Evans Memorial Hospital, 65 East Newton Street, Boston.
- Pathology and Physiology—Dr. F. W. Konzelmann, Temple University Hospital, Philadelphia.
- Nervous and Mental Diseases—Dr. F. P. Moersch, Mayo Clinic, Rochester, Minn.
- Dermatology and Syphilology—Dr. Hamilton Montgomery, 102 Second Avenue S.W., Rochester, Minn.
- Preventive and Industrial Medicine and Public Health—Dr. Paul A. Davis, 1436 Delia Avenue, Akron, Ohio.
- Urology—Dr. John H. Morrissey, 40 East Sixty-First Street, New York.
- Orthopedic Surgery—Dr. Fremont A. Chandler, 6 North Michigan Avenue, Chicago.
- Gastro-Enterology and Proctology—Dr. Grant H. Laing, 104 South Michigan Avenue, Chicago.
- Radiology—Dr. S. W. Donaldson, 326 North Ingalls Street, Ann Arbor, Mich.
- Anesthesiology—Dr. E. A. Rovenstine, 477 First Avenue, New York.

Applications for space in the Scientific Exhibit close on February 10. Blanks may be obtained from the section representatives or from the Director, Scientific Exhibit, American Medical Association, 535 North Dearborn Street, Chicago 10.

THE FARM FOUNDATION

The Farm Foundation was created in 1933 by a group of men who deeply desired a better life for the rural people of this nation. The founders included Alexander Legge and Frank O. Lowden. When he died, Alexander Legge left one half of his estate to the Farm Foundation. It is administered by a board of trustees which includes representatives of government, farmers, manufacturers, merchants, transportation and the universities. The director is Henry C. Taylor.

In its report covering the first ten years appears the following statement regarding medical care and the health of rural people:

In 1938 the Farm Foundation reviewed the work of medical care and health for rural people that was being carried on at various places in the United States and concluded that there was real need for an educational program to stimulate rural people to understand and solve for themselves the problems peculiar to each area.

The director of the Farm Foundation visited Nebraska and learned from rural women at a meeting in Lincoln that they would like help in developing a program of better medical care for their state.

"DOCTORS AT WAR" OPENS JANUARY 8

Doctors at War, the ninth series of dramatized network broadcasts by the American Medical Association and the National Broadcasting Company, opens January 8 and will run for approximately twenty-six weeks.

The series will continue to interpret the role of the doctor at war in a broad sense. Not only the doctor in uniform with the fighting forces, but the doctor on the home front, in industry and in public health service will be included. "All doctors are doctors at war wherever they may serve" will be the underlying theme of the program.

The program scripts will again be written by the veteran ace of medical script writers Mr. William J. Murphy, who has written for the American Medical Association all but two series and a portion of a third of previous dramatized broadcasts. The NBC orchestra will be conducted by Joseph Gallichio, well known to radio listeners. Production will be by Martin Wagner, who directed the second series of Doctors at War, predecessor program of Doctors at War. Distinguished doctors from the armed forces, from public health agencies and from civilian life will appear as summarizers on many of the programs; narrator will be Dr. W. W. Bauer.

The first four programs, with dates, titles and speakers, are as follows:

- January 8. "Wings for the Wounded." Speaker, Major Gen. Norman T. Kirk, M. C., Surgeon General, United States Army.
- January 15. "Abandon Ship." Speaker, Rear Admiral Ross T. McIntire (MC), chief, Bureau of Medicine and Surgery, United States Navy.
- January 22. "Honorable Discharge." Speaker to be announced.
- January 29. "Dangerous Hours." Speaker, Dr. Thomas Parran Jr., Surgeon General, United States Public Health Service.

Subsequent program announcements will appear in THE JOURNAL weekly and in HYGEIA monthly.

SOUTHWESTERN MEDICAL SCHOOL ON APPROVED LIST

The Council on Medical Education and Hospitals of the American Medical Association has voted to include the Medical School of the Southwestern Medical Foundation at Dallas, Texas, in its list of approved medical schools.

The Farm Foundation then secured the cooperation of the University of Nebraska. The university, with financial aid furnished by the foundation, undertook the project on medical care and health of rural people. The work was started in July 1939 under the auspices of the Extension Service in Agriculture and Home Economics of the University of Nebraska. Miss Elin L. Anderson, recommended by the Farm Foundation, was put in charge.

Work on the Nebraska project was started in Dawson County. The method of approach was educational. The objective was to get farm people and their doctors to confer together on the best method of securing a more adequate health and medical program. As a result of these conferences, the rural people of Dawson County became interested in developing prepayment plans for medical care as a means of providing for themselves preventive as well as curative medical services. At Farnam in one corner of the county a medical cooperative was formed in which families pay \$36 a year for general medical, surgical and hospital care. When developments of the same character in other parts of the county were blocked by some of the leaders of the county medical society, the rural people expressed the need for stronger support from their college of agriculture and the state medical society.

In the second year the educational program was extended to the entire state of Nebraska. A circular "Do We Want Health?" prepared by Miss Anderson was studied in the 1,700 home demonstration clubs in the state.

This study stimulated such interest that many round table conferences on medical care were held throughout the state. Action programs along various community health lines developed in a number of counties, but little progress was made in solving the economic problems of medical care.

The turning point in the study was reached in August 1941, when, following a state round table conference, a State Health Planning Committee was set up, composed of official representatives of the medical and dental professions, the university and certain rural organizations. This state committee gave first attention to aiding the people in sparsely settled areas in providing for themselves more adequate health services. By June 1942 the local people of Thomas County had set up a cooperative health association. For \$30 a year families receive the services of a well qualified physician and a public health nurse who make regular weekly visits to the five small communities. They cover an area of 1,000 square miles, rendering medical care and conducting programs of disease prevention and health education. This project has attracted wide attention through articles describing it in the January 1943 issues of the *Country Gentleman* and the *Farm Journal and Farmer's Wife*.

Members of the Nebraska state committee have assisted also in setting up a medical project sponsored by the United States Department of Agriculture. In Hamilton County, Neb., all farm families may pool 6 per cent of their net cash income with a maximum per family of \$57 for general medical, surgical and hospital care, some dental services and drugs. This project has been under way since August 1942.

The State Health Planning Committee has also given attention to enabling legislation for local public health departments. Some members of the committee were responsible for preparing the bill, planning hearings before the legislature's public health committee and preparing educational bulletins and fliers describing the need for this legislation.

Meanwhile the Nebraska Extension Service in Agriculture and Home Economics continues with a broad educational program on the medical care and health of rural people. A circular "Health on the Home Front," prepared by Miss Anderson for study by all the home demonstration clubs, has been a timely guide for wartime community health programs.

Interest in this project has spread far beyond Nebraska. Miss Anderson has been asked to serve on the Great Plains Regional Committee on Health and has already begun basic planning for this whole area. Ohio has set up a state health planning committee which has had Miss Anderson's services on three different occasions to help them think through the approach to their problem and plan the first steps in an educational and action program. Iowa and other states have made similar requests for help.

War has accentuated the problems of rural medical care so that everywhere there is a growing concern with basic planning during the war for more adequate postwar rural health programs.

The Farm Foundation believes that there are many different ways in which more adequate medical care can be acquired by rural people. Because the Farm Foundation believes that permanent improvement results from local initiative and will rather than from something superimposed from the outside, it does not urge the adoption of any specific plan or program. It holds that its function is to stimulate local interest in studying local needs and to help in the investigation of ways and means suited to the given community. It confines its efforts strictly to educational methods.

The bibliography follows:

- Anderson, Elin L.: *Do We Want Health?* University of Nebraska College of Agriculture and U. S. Department of Agriculture Cooperating, Extension Circular 1021. Lincoln, Neb., September 1940; 32 pages.
- Health on the Home Front, University of Nebraska College of Agriculture and U. S. Department of Agriculture cooperating, Extension Circular 1923. Lincoln, Neb., 1942; 14 pages.
- "Family Health Plan," q. v., was prepared to supplement this circular.
- Family Health Plan, University of Nebraska College of Agriculture and U. S. Department of Agriculture cooperating, Supplement 26. Lincoln, Neb., 1942; 8 pages.
- Prepared to supplement "Health on the Home Front," q. v. Extension Circular 1023.
- Mobilizing Home Forces for a Health Campaign, University of Nebraska College of Agriculture and U. S. Department of Agriculture cooperating, Extension Circular 5-92. Lincoln, Neb., August 1942; 8 pages; mimeographed.
- Nebraska Pioneers in Rural Medical Care, *Medical Care* 2: 303-313 (Oct.) 1942.
- Nebraska's Extension Service on the Health Front, *J. Home Econom.* 35: 137-141 (March) 1943.
- Streeter, Carroll P.: Sand Hills Medicine, *Farm J. and Farmer's Wife* 67: 38-39 (Jan.) 1943.
- Mullen, Eileen: No Doctor Shortage Here: Enterprising ranchers in the Sand Hills of Nebraska have found the way to get and keep a doctor and a nurse in their thinly populated country. *Country Gentleman* 113: 16, 68 (Jan.) 1943.

NEW ADVISORY MEMBERS FOR CHILDREN'S BUREAU

The United States Children's Bureau announces the appointment of the following new members of the Children's Bureau Advisory Committee on Maternal and Child Health Services. These members were appointed in response to the resolution adopted by the Advisory Committee on Oct. 21, 1943, requesting that the committee be enlarged by the appointment of at least five physicians actively engaged in the private practice of medicine:

- Dr. Sterling H. Ashmun, Dayton, Ohio.
Dr. Harvey F. Garrison, Jackson, Miss.
Dr. Eleanor Harvey, Newport News, Va.
Dr. John Preston, Tryon, N. C.
Dr. S. A. Thompson, Camden, Ark.
Dr. George D. Cannon, New York.

In addition, the following members of the Children's Bureau Commission on Children In Wartime have been appointed ex officio on the Advisory Committee on Maternal and Child Health Services:

- Dr. Frederick H. Allen, Philadelphia.
Dr. Leona Baumgarten, New York.
Dr. Reginald M. Atwater, New York.
Dr. Franklin P. Gengenbach, Denver.
Dr. Joseph S. Wall, Washington, D. C.

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status.—H. R. 149 has been reported to the Senate, a bill to fix a reasonable definition and standard of identity of certain dry milk solids. H. R. 3687 has been reported to the Senate with amendments, a bill to provide revenue. As reported by the Senate, the bill retains the provision under which many associations now exempt from federal income taxes under section 101 of the Internal Revenue Code will be required to file annually informational returns with the Commissioner of Internal Revenue. Associations exempted under section 101(6) and section 101(7), other than certain educational and charitable organizations, will be obligated to file such returns. The bill does not contemplate that the income of such exempt organizations will at this time be subjected to tax. The Senate Committee on Education and

Labor has been conducting hearings on S. 1509, introduced by Senator Thomas, Utah, a bill to provide for the education and training of members of the armed forces and the merchant marine after their discharge or conclusion of service.

Bills Introduced.—H. R. 3846, introduced by Representative Barden, North Carolina, and H. R. 3850, by Representative Outland, California, provide for education and training of members of the armed forces and merchant marine after separation from service. H. R. 3892, introduced by Representative Miller, Connecticut, provides that prior to trial of any member of the land forces before a general or special court martial or of any member of the naval forces before a general or summary court martial, he shall be given a psychiatric examination, under the direction of the court, to determine his mental condition and the existence of any mental disease or defect.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARKANSAS

District Meeting.—The Ninth Councilor District Medical Society was addressed in Harrison, December 8, by:

Dr. Ruth Ellis Lesh, Fayetteville, Torsion of Ovarian Cysts in Children.
Dr. Francis T. H'Doubler, Springfield, Mo., Perforated Peptic Ulcer.
Dr. Urban J. Busiek, Springfield, Immunization Procedure.
Dr. Walter S. Sewell, Springfield, Pyelitis.
Dr. William A. Fowler, Fayetteville, The Physiology and Mechanism of Labor.

The Ninth Councilor District is made up of Baxter, Boone, Carroll, Marion, Newton and Searcy counties.

CALIFORNIA

Course in Venereal Diseases.—The University of Southern California School of Medicine, cooperating with the Los Angeles Department of Health and the state department of public health, opened a course in the diagnosis and treatment of syphilis and gonorrhea, January 3, to continue through January 14. Qualified licensed physicians are eligible for the course, which is given with the approval of the U. S. Public Health Service and the Los Angeles County Medical Association.

COLORADO

Consultation Fees of Teachers Revert to Institutions.—The board of regents of the University of Colorado, Denver, on November 19 unanimously approved the employment of full time teachers in the departments of medicine, surgery, obstetrics and gynecology and pediatrics with the understanding that all fees, if any, received by these teachers for consultation work be turned into the university treasury, the teachers' salaries to be fixed to take into account the fact that these men are not entitled to such fees themselves. This action was taken after earlier consideration and agreement "that it is very detrimental to the future of the medical school for a full time man to be allowed to carry on the private practice of medicine and consultation for his own gain," a conclusion reached at a meeting of the public policy committee of the Colorado State Medical Society with representatives of the medical school and the university. The committee went on record (1) favoring the raising of salaries of all full time heads of departments and their associates in the school of medicine, the Colorado General Hospital and the Colorado Psychopathic Hospital, Denver, to an adequate figure and (2) allowing full time men the privilege of consultation when it is arranged for through the head of the department and requested by a duly licensed doctor of medicine, the fees for the consultation to be collected by the medical school and the two hospitals and turned in to their respective funds.

CONNECTICUT

Russell Chittenden Dies.—Russell Henry Chittenden, Sc.D., emeritus director of the Sheffield Scientific School at Yale University, New Haven, died at his home in New Haven, December 26. Dr. Chittenden, who in 1934 received the honorary M.D. degree from the Connecticut State Medical Society, was a pioneer in the field of nutrition and was credited with the discovery of protein in food. Dr. Chittenden was a senior in the scientific school at Yale in 1875 when he discovered the presence of glycocoll and glycogen in scallops, said to be the first time a free amino acid in living tissue had been isolated. Dr. Chittenden was the author of a number of books on his subject and in 1907 published "The Nutrition of Man," which became a standard work on nutrition. He received his Ph.B. at the Yale Scientific School in 1875, a Ph.D. in 1880 and later degrees from other universities. He was a member of the staff at the scientific school from 1875, serving as director from 1898 to 1922, when he retired. He had once served as a member of the referee board of consulting scientific experts to the secretary of agriculture and had, in addition to holding memberships in numerous scientific groups, served as president of the American Society of Naturalists, American Physiological Society and the American Society of Biological Chemists. He became an honorary fellow of the New York Academy of

Medicine in 1930. The honorary degree of doctor of medicine conferred by the Connecticut State Medical Society was the first time in one hundred and twenty-one years that the society had exercised this honor. The citation read:

This honor, now held by no living man, is about to be conferred upon you in recognition of your valuable contributions to our knowledge of the human body and because of the inspiration derived from your instruction by many who later achieved marked success in the practice of medicine.

ILLINOIS

Graduate Conference.—On December 16 the Illinois State Medical Society sponsored the Northern Illinois Post Graduate Conference at the Fort Armstrong Hotel, Rock Island. The speakers were Dr. Walter H. Nadler, Chicago, on "Nonsurgical Conditions of the Abdomen," Dr. G. Henry Mundt, Chicago, "Ear, Nose and Throat Conditions" and Dr. Lowell D. Snorf, Evanston, "The Discriminate Use of the Sulfonamides."

Chicago

Dental Society Award Goes to Dr. Luckhardt.—The Ohio State Dental Society at a meeting in Cleveland, November 8, presented its Callahan Memorial Award to Dr. Arno B. Luckhardt, professor of physiology, University of Chicago School of Medicine, for his contributions to humanity and the healing arts. The award is a gold medal.

The Fenger Lecture.—Dr. Howard T. Karsner, professor of pathology and director of the Institute of Pathology, Western Reserve University School of Medicine, Cleveland, will deliver the eighth Christian Fenger Lecture of the Institute of Medicine of Chicago and the Chicago Pathological Society at the Palmer House on February 14. Dr. Karsner's subject will be "Calcific Aortic Stenosis."

INDIANA

Appointments in Physical Therapy.—Drs. George J. Garceau and James S. Battersby, members of the staff of Indiana University Medical Center, Indianapolis, have been appointed medical supervisors of the physical and occupational therapy departments at the center. The directorship of the two departments was recently made vacant by appointment of Mrs. Winifred C. Kahmann as superintendent of the newly created occupational therapy unit in the reconditioning division in the surgeon general's office of the U. S. Army. Dr. Garceau, associate professor of orthopedic surgery in the school of medicine and chief orthopedic surgeon at the James Whitcomb Riley Hospital for Children, will have medical supervision of physical therapy and Dr. Battersby, resident surgeon at the center, will have medical supervision of the occupational therapy department.

KENTUCKY

New Health Center.—On October 5 the new quarters of the preventive section of the Louisville and Jefferson County Health Department were formally dedicated. The building cost \$113,369 and is located adjacent to the Louisville General Hospital. It will house the director of health, assistant directors in charge of communicable disease control, school health, home medical care and clinics, nursing bureau, maternal and child health bureau, health education and library, food and sanitation division, general preventive clinic and venereal disease control bureau. A feature of the new building includes a general library, consisting at the present of about 500 volumes in addition to bound periodicals and encyclopedias. Prior to the installation of the library the various divisions kept their own reference books.

LOUISIANA

Hull Award Goes to Senior Student.—Dr. Herbert Derman, a member of the senior class of the Louisiana State University School of Medicine, New Orleans, was presented with the Hull Award during the annual banquet of the Louisiana State University Society of Medical Sciences. Dr. Derman is also president of the society. The recipient for the award is selected by vote of members of the society on the basis of scholastic attainments and those qualities considered most desirable in the practice of medicine.

Dr. Schenken Gives Chaillé Oration.—Dr. John R. Schenken, professor of pathology and bacteriology, Louisiana State University School of Medicine, New Orleans, gave the annual Stanford E. Chaillé Memorial Oration December 16. The subject was "The Carcinogenic and Carcinostatic Effects of Estrogenic Substances: A Study of the Changes in the Mammary and Prostate Glands." The lecture is sponsored

by the Orleans Parish Medical Society to perpetuate the memory of Dr. Chaille. This is the first time that a member of the society has given the lecture, which was established in 1926.

Branch Meeting on Clinical Research.—The Southern sectional meeting of the American Federation for Clinical Research was held at Charity Hospital, New Orleans, December 3-4. Among the speakers were:

- Dr. John S. Harter, Jackson, Miss., The Prevention of Empyema Following Lobectomy for Bronchiectasis.
- Dr. Wallace Marshall, Mobile, Ala., Pathogenesis of Keloids with Clinical Applications in Medicine and Surgery.
- Drs. Byron E. Hall, Malcolm M. Hargraves and Charles H. Watkins, Rochester, Minn., Treatment of Polycythemia Vera with Radioactive Phosphorus.
- Dr. Joseph S. D'Antoni, New Orleans, Diodoquin Therapy in Amebiasis.
- Dr. William K. Purks, Vicksburg, Miss., Postural Hypotension.
- Dr. John C. Henthorne, Jackson, Fibrous Tumors of the Female Breast.
- Dr. John B. Johnson Jr., Washington, D. C., Physiologic and Clinical Effects of Acacia in the Treatment of Nephrotic Edema.

MASSACHUSETTS

Licenses Revoked.—The Massachusetts Board of Registration in Medicine on November 19 revoked the license to practice medicine of Dr. Aaron O. Bernstein, Athol, because of misconduct in the practice of his profession. The license of Dr. Manford R. Spalding was revoked October 6. Dr. Spalding had been found guilty of narcotic charges and sentenced to six months in the House of Correction in Salem.

The Dunham Lectures.—Dr. Frank Macfarlane Burnet, assistant director and head of the virus department, Walter and Eliza Hall Institute of Research in Pathology and Medicine, Royal Melbourne Hospital, Melbourne, Australia, spoke under the Edward K. Dunham Lectureship for the promotion of the medical sciences at Harvard Medical School, Boston, January 10, 12 and 14, on "Some Virus Diseases of Man—Evolutionary and Ecological Considerations." Individual titles will be "The Origins of Human Infectious Disease," "Herpes and Poliomyelitis" and "Influenza."

Obstetric Meeting.—The New England Obstetrical and Gynecological Society held its fifteenth annual meeting at the Harvard Club, Boston, December 8. The program consisted of clinics and pathologic conferences and included:

- Dr. Louis E. Phaneuf, Boston, Complete Tears of the Perineum and Rectovaginal Fistulae.
- Dr. Roy J. Heffernan, Brookline, Mass., The Use of the Sulfanilamide Gauze Pack in Obstetrics and Gynecology.
- Dr. Maurice O. Belson, Boston, The Diagnosis of Early Carcinoma of the Cervix.
- Dr. S. Charles Kasdon, Boston, The Rh Factor in Obstetrics and Gynecology.
- Dr. Philip B. Keitlen, Pittsburgh, X-Ray Pelvimetry on the Obstetrical Service of a General Hospital.
- Dr. Arthur T. Hertig, Boston, Spontaneous Abortion—Pathogenesis and Treatment.
- Dr. John Rock, Boston, The Incidence of Tuberculous Endometritis in Endometrial Biopsies for the Diagnosis of Infertility.
- Dr. Edwin F. Daily, Washington, D. C., Emergency Maternity and Infant Care Programs.

MICHIGAN

Changes in Health Officers.—Dr. John W. O'Neill, St. Charles, has been appointed health officer of district number 5, including Nawaygo, Lake and Oceana counties, succeeding Dr. Albert C. Edwards. Dr. O'Neill's headquarters will be in White Cloud.—Dr. Lars W. Switzer, Manistee, resigned as director of the Manistee-Benzie County health department December 1 to become associated with General Motors Corporation, Bay City.

Battle Creek Sanitarium Continues.—The Battle Creek Sanitarium, operating in a group of buildings on the west side of Washington Avenue, Battle Creek, will continue its activities, carrying out the wishes of its late director, Dr. John H. Kellogg. Late in 1942 the activities of the sanitarium were transferred to this group of buildings after the physical plant of the sanitarium had been converted into the Percy Jones General Hospital by the government. One building had been built for sanitarium purposes and had been used as an annex. Another building with a gymnasium, library rooms, assembly hall, administration offices and laboratories had been built and used by Battle Creek College, which suspended operation a number of years ago on account of financial difficulties. A third building gives the sanitarium accommodations of about 300 beds. Despite the fact that the main buildings had been transferred to military purposes, the activities of the sanitarium have been going on. The work of the sanitarium was not interrupted for even one day during the removal.

MISSISSIPPI

New Members of Board of Health.—Dr. Reuben B. Caldwell, Baldwyn, has been appointed a member of the state board of health to succeed Dr. James W. Lipscomb, Columbus, president of the board since 1932, and Dr. Paul G. Gamble, Greenville, will succeed Dr. Leonidas B. Austin, Rosedale, a member of the board for nineteen years.

MISSOURI

The Terry Lectures.—At a meeting of the St. Louis Medical Society December 21, lectures under the Robert J. Terry Lectureship were presented by Dr. Henry Pinkerton, St. Louis, on "Typhus Fever, Rocky Mountain Spotted Fever and Other Rickettsial Diseases" and Comdr. Alphonse McMahon and Lieut. Comdr. James M. Macnish (MC), U. S. Naval Reserve, "Diseases in the South Pacific with Special Reference to Diseases of the Tropics."

Personal.—Dr. Homer A. Sweetman, acting resident psychiatrist at the Malcolm A. Bliss Psychopathic Institute, St. Louis City Hospital, has been appointed superintendent of the St. Louis City Infirmary.—Dr. Paul J. Schrader has resigned as superintendent of State Hospital number 2 at St. Joseph.—Dr. Major G. Seelig, director of pathology at the Barnard Free Skin and Cancer Hospital, St. Louis, and professor of clinical surgery, Washington University School of Medicine, has been appointed a member of the Missouri State Cancer Commission by Governor Forrest C. Donnell.

State Survey Authorized to Determine Medical Education Needs.—The curators of the University of Missouri, Columbia, have approved a survey of the state's needs and resources for medical education preliminary to the establishment of a university policy regarding the institution's participation in medical education and conditions under which the program should be carried on, newspapers reported recently. The action, which has been under consideration by the board for several months, was formally approved at a meeting in St. Louis with the understanding that the study place special emphasis on the means, if any, through which graduates of the medical school may be induced to practice in the rural areas of Missouri. Newspapers stated that extent of the school's curriculum has been a particular problem since 1910, when the university dropped the final two or clinical years of medical instruction, requiring graduates of its medical school to transfer on their graduation with a bachelor's degree to some other institution for the final two years of instruction leading to the degree of doctor of medicine. In 1942 Kansas City alumni of the university proposed establishment of the clinical years of medical work at Kansas City, and the city offered use of its general hospital for the purpose. Recently the curators of the university withdrew their first approval of this plan. Members of the board of curators and of the medical school staff will conduct the survey. Medical schools to be visited will include those of the universities of Michigan, Ann Arbor, Virginia, Charlottesville, Wisconsin, Madison, and Tennessee, Memphis. The schools at Illinois, Chicago and Iowa City, have already been inspected as a part of the program. According to newspaper reports, among the subjects to be stressed in the survey is the future status of the two year medical school in the face of changing practices in medical instruction, which have made some authorities take the view that the two year plan is now obsolete, or the necessity for having the full four year course at the same site because of changes in instruction methods, and the financial commitments which would be involved in the maintenance of a full four year curriculum.

NEW YORK

Personal.—The Cortland County Board of Health is still seeking a successor for Dr. William E. Mosher Jr., Cortland, in order that he may be released for military service. Dr. Mosher, who had expected to enter military service, is still health commissioner in Cortland County. Dr. Bernard McD. Krug, New York, who was announced recently as the successor to Dr. Mosher, is unable to accept the appointment.

Submission of Malaria Specimens.—Effective January 1 the state sanitary code has been amended to require the submission of a thick film as well as a thin film when a diagnosis of malaria is considered, according to *Health News*. Both thick and thin films of blood on glass slides should be collected preferably between twelve and twenty-four hours after a chill (slide outfit). Stressing the importance of the manner in which the blood films are prepared, *Health News* has made available recommendations for the procedure.

Bequest Creates Professorship of Medicine.—The Edward C. Reifstein professorship of medicine will be set up at Syracuse University through a stipulation in the will of the late Horace White, formerly governor of New York. After establishing life trust funds of \$200,000 the will provides that three fourths of the residuary estate shall go to Cornell University at Ithaca and one fourth to Syracuse, the latter to be known as the Horace White Fund and the income to be used to pay the salary for the Reifstein professorship. The \$200,000 set up for life trusts will ultimately go to the two universities in their proportionate shares, *Science* reports.

New York City

Lois Miller Honored.—Mrs. Lois Mattox Miller, at a formal gathering of the Academy of Science in Havana, December 6, was made a commander of the Order of National Merit. Mrs. Miller, a member of the editorial staff of *Reader's Digest* and a writer on medical topics, was given the award in recognition of her work in the field of tropical medicine. She has also been made a life member in the Medical Society of Cuba.

Scientists Honored.—Duncan A. MacInnes, Ph.D., member of the Rockefeller Institute for Medical Research, was elected president of the New York Academy of Sciences at its annual meeting December 15. Life membership was awarded to Dr. Alexander Fleming, University of London, Sir Frederick Gowland Hopkins, University of Cambridge, Dr. Oswald T. Avery, Rockefeller Institute, Alfred L. Kroeber, Ph.D., director of the museum of anthropology, University of California, Berkeley, Arne V. Tiselius, biochemist of the University of Uppsala, Sweden, and T. Svedberg, head of the physical chemistry institute of the University of Uppsala.

Biologic Appointments to Research Laboratories.—Recent appointments to the staff of the biologic division of Food Research Laboratories, Long Island City, include Nathan Rakieten, Ph.D., formerly of the Laboratory of Applied Physiology, Yale University, New Haven, Conn., and lately first lieutenant in the U. S. Army Air Corps, and Roslyn T. Roth, Ph.D., formerly research microanalyst at New York University and more recently biochemist at New York Psychiatric Institute, Columbia Medical Center. Dr. Rakieten will supervise the animal laboratories, and Dr. Roth will specialize in the statistical aspects of the design and interpretation of bioassays.

TEXAS

Chamber of Commerce Controls Health Unit.—On October 7 a city ordinance was passed by the city council in San Antonio which places the control of the health unit under the direction of the local chamber of commerce. Nominations of the new board of seven members were to be made by the directors of the chamber of commerce, their terms to be two years. Physicians named to the new board are Drs. Patrick I. Nixon and Herbert J. Schattenberg.

Dr. Ewalt Named Acting Director of Psychopathic Hospital.—Dr. Jack R. Ewalt, associate professor of neuropsychiatry at the University of Texas Medical Branch, Galveston, and director of the electroencephalography unit of the John Sealy Hospital, has been appointed acting director of the Galveston State Psychopathic Hospital. The latter institution was closed in the summer by the state board of control on the basis that the buildings housing its operating staff had suffered storm damage.

New Appointments at Texas.—Charles M. Pomerat, Ph.D., professor of biology, University of Alabama, University, has been appointed professor of anatomy at the University of Texas Medical Branch, Galveston. R. W. Strandtmann, Columbus, Ohio, is now assistant professor of entomology in the department of preventive medicine and public health at the medical school. Ardell N. Taylor, Ph.D., formerly with the University of Texas, Austin, is now instructor in physiology at the medical branch and Dr. Jewell G. Hamrick, Dallas, instructor in pathology. George A. Emerson, Ph.D., associate professor of pharmacology, West Virginia University School of Medicine, Morgantown, has been named professor of pharmacology at the school.

VIRGINIA

Governor Challenges Physicians to Provide Lower Costs.—At a meeting of the Seaboard Medical Association in Richmond, December 2, a resolution was adopted to "take all possible steps to influence the enactment of laws for a more adequate distribution of medical and hospital care," the resolution to be sponsored by the medical profession of North Carolina and Virginia. To implement the program the association urged

the appointment of a special committee to confer with Governor Broughton of North Carolina and Governor Darden of Virginia for the purpose of suggesting and sponsoring such legislation as will be in keeping with the best traditions of the medical profession and serve the best interests of the public as a whole. The action followed the earlier warning of Governor Darden in an address in which he said that the federal government would get control of medicine unless physicians offered a better plan than the one now before congress.

Special Society Elections.—At recent meetings the following societies chose the officers indicated:

Virginia Obstetrical and Gynecological Society: Dr. Adrian L. Carson Jr., Richmond, president, Dr. Samuel E. Oglesby, Lynchburg, vice president and Dr. Lacy L. Shamburger, Richmond, secretary and treasurer.

Virginia Orthopedic Society: Dr. James B. Dalton, Richmond, president and Dr. James T. Tucker, Richmond, secretary.

Virginia Pediatric Society: Dr. Edwin A. Harper, Lynchburg, president, Dr. Robert B. Hightower, Alexandria, vice president and Dr. Emily Gardner, Richmond, secretary-treasurer.

Virginia Radiological Society: Dr. Clayton W. Eley, Norfolk, president, Dr. William P. Gilmer, Clifton Forge, vice president and Dr. Edward Latane Flanagan, Richmond, secretary-treasurer.

Virginia Urological Society: Dr. Thomas B. Washington, Richmond, president, Dr. Samuel A. Vest Jr., Charlottesville, vice president and Dr. Warren W. Koontz, Lynchburg, secretary-treasurer.

Virginia Section, American College of Physicians: Dr. Wyndham B. Blanton, Richmond, president and Dr. Alex F. Robertson Jr., Staunton, secretary-treasurer.

Dr. John Shelton Horsley, Richmond, was reelected president of the Virginia Cancer Foundation at its meeting in October. Dr. James R. Cash, Charlottesville, was named chairman of a committee on fellowship for cancer study.

WASHINGTON

Personal.—Dr. Percy S. Pelouze discussed gonorrhea before the Walla Walla Valley Medical Society, December 8.—Dr. Arthur L. Windom has resigned as superintendent of the King County Tuberculosis Hospital, Seattle.—Dr. Ralph L. Gregg, who concluded his internship at the King County Hospital, Seattle, January 1, has been appointed assistant superintendent of the hospital.

Hospital News.—It has been recommended that the Seattle City Hospital be abandoned and all city patients be treated at the King County Hospital, according to *Northwest Medicine*. The Public Safety Building, in which the city hospital is housed, is in poor condition and not suited for a modern hospital, it was stated. Clark General Hospital, Vancouver, was recently bequeathed \$100,000.

HAWAII

Territorial Election.—Dr. Douglas B. Bell, Honolulu, was chosen president of the Hawaii Territorial Medical Association during its annual meeting in May. Other officers are Dr. Arthur V. H. Molyneux, secretary and Dr. Stewart E. Doolittle, treasurer, both of Honolulu. Vice presidents are Drs. Leo L. Sexton, Hilo, Nathaniel M. Beniys, Honolulu, Samuel R. Wallis, Lihue, and Katsuyuki Izumi, Wailuku.

New Public Health Appointments.—Dr. Richard K. C. Lee, Honolulu, since 1937 deputy territorial commissioner of public health, in July became director of public health, a newly created position. Dr. Lee graduated at Tulane University of Louisiana School of Medicine, New Orleans, in 1933 and received the degree of doctor of public health at Yale University in 1938. The *Hawaii Medical Journal* says that Dr. Lee is the only physician in the territory who could have qualified for the position under the recently repealed law which fixed the educational and experience qualifications for the leading position in Hawaii's public health organization. He has at various times served as acting director of the bureaus of maternal and child health, communicable diseases and tuberculosis and as acting territorial commissioner of public health. He has lectured on public health administration at the University of Hawaii annually since 1937. He holds a reserve commission in the U. S. Public Health Service.—Dr. Charles L. Wilbar Jr., Honolulu, became president and executive officer of the Territory of Hawaii Board of Health, June 25, following his release from the army. Dr. Wilbar graduated at the University of Pennsylvania School of Medicine, Philadelphia, in 1932 and served his residency in medicine at the Queen's Hospital, Honolulu. After his two years service as director of the bureau of maternal and child health of the territorial board of health he was given a leave of absence to study postgraduate training in pediatrics in Cincinnati. He went into active army service on Dec. 13, 1941, serving first as captain and later as major. His army service included an assignment as health officer for the county of Maui.

GENERAL

Examination in Otolaryngology.—The American Board of Otolaryngology will hold its next examination at the Waldorf-Astoria, New York, June 1-4. The meeting that was tentatively scheduled to be held in Los Angeles in February 1944 has been canceled. Dr. Dean M. Lierle, University Hospitals, Iowa City, is the secretary-treasurer of the board.

Pediatric Board Reopens Group I.—The American Board of Pediatrics at its recent annual meeting decided to reopen group I, which requires that an applicant shall have been specializing in pediatrics for ten years or more. Group I will be kept open until July 1. All candidates regardless of training or length of time in practice must take both the written and the oral examinations.

Committee on Professional Relations.—On December 2, Pan American Health Day, the American Public Health Association announced the appointment of a committee on professional relations with Latin America under the chairmanship of Louis I. Dublin, Ph.D., third vice president and statistician of the Metropolitan Life Insurance Company, New York. Other members of the committee are:

Robert S. Breed, Ph.D., chief, division of bacteriology, New York Agricultural Experiment Station, Geneva, N. Y.

Gordon M. Fair, C.E., professor of sanitary engineering, Harvard University, Cambridge, Mass.

Dr. Henry E. Meleney, Herman M. Biggs professor of preventive medicine, New York University College of Medicine, New York.

Nathan Sinai, D.P.H., professor of hygiene and public health, University of Michigan, Ann Arbor, Mich.

Dr. Ernest L. Stebbins, commissioner of health of New York City.

Clair E. Turner, Dr.P.H., professor of biology and public health, Massachusetts Institute of Technology, Cambridge.

Grants for Research in Endocrinology.—Requests to the National Research Council Committee for Research in Endocrinology for aid during the fiscal period from July 1, 1944 to June 30, 1945 will be received until Feb. 28, 1944. Application blanks may be obtained by addressing the division of medical sciences, National Research Council, 2101 Constitution Avenue, Washington, D. C. In addition to a statement of the problem and research plan or program, the committee desires information regarding the proposed method of attack, the institutional support of the investigation and the uses to be made of the sum requested. No part of any grant may be used by the recipient institution for administrative expenses. Applications for aid of endocrine research on problems of sex the narrower sense cannot be given favorable consideration, but the committee will consider support of studies on the effects of sex hormones on nonsexual functions, for example on metabolism.

Fraudulent Representative of Manhattan Manufacturing Company.—The Manhattan Manufacturing Company of Chicago writes that an impostor has been soliciting orders in the name of the company, obtaining substantial deposits or full payments based on quick delivery or on unusually low prices. The name most frequently used is Mr. F. H. or A. H. Lancaster. The Manhattan Company states that every bona fide sales representative signs a bond application and that it does not now have nor ever had any one on its sales staff with this name or a similar one. The company states further that this impostor has sold bedding, towels, sheets and such items under its name even though it has never manufactured, handled, sold or had any catalogues illustrating such merchandise. The company suggests that a prospective purchaser observe that order books shown by the salesman contain the printed name of the company and that catalogues illustrate the indicated order bearing the same name as the order books. Customers should not pay any money on a blank form of an order on which the company's name is written by hand or rubber stamped. Instead the customer should offer to send the money directly to the company. The Manhattan Manufacturing Company regrets that this fraudulent representative has been mulcting the public and will appreciate any effort to apprehend him.

War-time Strains Responsible for Increased Death Rate.—The increased death rate in the population of the United States in ages over 50 years during the last twelve months is a result of the greater strains and the frequent exposures to disease that are a part of war-time life, according to the Bureau of the Census, U. S. Department of Commerce, Washington, commenting on a special study recently concluded. The fact that a large number of older persons have returned to a strenuous working life after years of retirement certainly has played a part in the increase, it was stated. From 1940 through 1942 the death rates by age and race in the United

States dropped gradually by amounts varying from 319 per cent to 11.1 per cent among the white and 5.9 per cent to 24.3 per cent among the nonwhite. In general the rates at the younger and older ages in both white and nonwhite declined more than the rates at the middle ages. However, when the returns from the bureau's 10 per cent mortality sample for the twelve month period ended September 1943 are compared with the final statistics for the calendar year 1942 it is seen that there have been significant increases in the white mortality at ages over 50 years. Every age group above that age has shown an increase, while at the ages below 50 the rates have remained practically stationary with the exception of the rate for ages under 5 years, which dropped 4.5 per cent in the period. The increases at the older ages ranged from 3.0 to 5.6 per cent. In the nonwhite group of the population the changes at ages over 50 years show a somewhat different pattern. Between 50 and 65 years and over 75 years the death rates increased, while between 65 and 75 they declined.

Sixth Annual Forum on Allergy.—The sixth annual forum on allergy will be held at the Statler Hotel, St. Louis, January 22-23. A feature of the meeting will be the presentation of the gold medal for outstanding contributions to clinical allergy to Dr. Robert A. Cooke, New York. Dr. Cooke will deliver the fourth annual forum lecture on "Observations on Allergic Reaction." Other speakers will include:

Roger P. Wodehouse, Ph.D., Yonkers, N. Y., Pollens in Hay Fever.

Dr. Edna S. Pennington, Nashville, Tenn., Allergy in the Older Housewife.

Dr. Alan G. Cazort, Little Rock, Ark., Critical Evaluation of Drugs Used in Treatment of Asthma.

Dr. Ethan A. Brown, Boston, Importance of Environmental Factors in the Management of the Allergic Patient.

Dr. Frederick W. Wittich, Minneapolis, Allergy to Fungi.

Dr. Milton B. Cohen, Cleveland, The Application of the Principles of Immunology to the Management of the Allergic Patient.

Dr. Elwood A. Sharp, Detroit, Endocrine Glands of the Allergic Patient.

Dr. Charles T. Eyermann, St. Louis, The Importance of Controlling During the Season of the Sensitization to Other Allergens: (a) Foods; (b) Other Inhalants.

Dr. Isidore S. Kahn, San Antonio, Texas, How Is the Specific Seasonal Treatment Best Carried Out?

Dr. William P. Garver, Cleveland, Is Perennial Treatment Superior to the Preseasonal Method of Treatment?

Dr. Carole B. Bohner, Indianapolis, What Is the Present Status of Oral Pollen Therapy?

Dr. Carliss M. Stroud, St. Louis, What Is the Optimum Dose of Pollen with Which to Approach the Season? Are Large Doses or Small Doses Advantageous Over the Moderately Sized Doses?

Dr. Abraham Colmes, Boston, Is There Any Advantage in Giving the Well Treated Patient Any Type of Pollen Therapy During the Season?

Dr. Samuel M. Feinberg, Chicago, What Is the Proper Specific Therapy in the Management of Pollen Asthma?

Dr. Karl D. Way, Akron, How Can We Avoid Constitutional Reactions?

Dr. Ralph G. Mills, Decatur, Ill., Is There Any Advantage in Giving Vitamins and Minerals as Supplemental Feedings or as Drugs During the Hay Fever Season to the Hay Fever Patient?

Dr. Armand E. Cohen, Louisville, Ky., Are Nose Drops Beneficial or Harmful? If Prescribed, Which Ones?

Dr. James Harvey Black, Dallas, What Seasonal Precautions on the Part of the Patient Are of Practical Importance in the Management of a Case of Hay Fever?

Dr. Albert Kuntz, St. Louis, The Autonomic Nervous System and the Allergic Patient.

Dr. Harry L. Alexander, St. Louis, Treatment of Intractable Asthma.

A series of study groups will be conducted Saturday with the following physicians in charge:

Dr. Theodore L. Squier, Milwaukee, Allergic Manifestations in the Blood.

Dr. Herbert J. Rinkel, Kansas City, Mo., Food Allergy.

Dr. Cecil M. Kohn, Kansas City, Mo., Physical Allergy.

Dr. Stephan Epstein, Marshfield, Wis., Specific Treatment of Contact Dermatitis.

Dr. Stanley F. Hampton, University City, Mo., Conduct of Allergy Clinics.

Dr. Theron G. Randolph, Ann Arbor, Mich., Lymphocytes in Relation to Allergy Anaphylaxis and Immunity.

Dr. Orval R. Withers, Kansas City, Mo., Allergic Headaches.

Dr. French K. Hansel, St. Louis, Allergic Coryza.

Dr. Karl D. Figley, Toledo, Ohio, The Clinical Management of House Dust Sensitivity.

Dr. Ralph Bowen, Houston, Texas, Food Allergy in Children.

Dr. Fannie Lou B. Lency, Oklahoma City, Management of Asthma in Children.

Dr. Carroll M. Pounders, Oklahoma City, Vasomotor Rhinitis in Children.

Dr. Bernard G. Efron, New Orleans, Allergy Manifestations Without Positive Skin Tests.

Dr. George E. Rockwell, Cincinnati, Chemical Nature and Standardization of Pollen Antigen.

Dr. Russell J. Blattner, St. Louis, "Sulfa" Drugs and Hypersensitivity.

On January 21 the Association of Allergists for Mycological Investigation will meet with Dr. Homer E. Prince, Houston, presiding.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Nov. 20, 1943.

Medical Education in German Prison Camps

The work of the War Organization of the British Red Cross Society for prisoners of war in Germany includes provision of parcels of food and clothing and, among other things, an educational books section which enables the younger men whose education or training has been arrested to employ their enforced leisure with some profit. Many institutions and colleges have provided books on almost every subject and also courses of lectures. A scheme by which the prisoners can take examinations has been adopted with the permission of British and German authorities. Most of the English universities cooperate in this. Medical students who are prisoners are well cared for and have an advantage over other groups in that the camp medical officer is available for coaching. Camp medical officers have been provided with appropriate textbooks and schedules for coaching men up to the standard of the first M.B. examination. In one camp the education officer has procured locally a number of cats, earthworms and other animals for dissection. Theoretical examinations actually take place, monitors being appointed in the usual way and the papers are returned to the examiners in England. However, it is not possible to hold examinations involving practical work. One enthusiastic group has asked for a complete human skeleton and a set of microscopic slides illustrating normal histology. These are being specially prepared.

Subjects allied to medicine, such as first aid and home nursing, are also included, principally for the benefit of nursing and medical orderlies in the camps. Standard Red Cross handbooks and wall charts have been sent. Examinations are held by the medical officers, who declare the result and issue temporary certificates. These will be exchanged for official forms after the war. Prisoners are working for examinations in chiropody, massage and medical gymnastics. It is hoped to arrange for certain blinded prisoners, already advanced in their study of the practical side of massage, to be permitted to take some part of their examination.

A great initial difficulty was the arrangement for a room which could be kept silent and undisturbed for study and examinations. Energetic camp education officers requested and eventually got what they wanted from the German authorities. As the interest of prisoners grew, it became obvious not only that an interesting way of employing enforced leisure had been found but also that it would help the men with plans for their immediate future on their return to civilian life. At the same time the awful period of mental stagnation complained of by so many prisoners after the last war, which took months or even years to get over, will be avoided.

War Difficulties of Medical Publications

The shortage of paper due to the war has produced government control of its use. Medical journals, like other periodicals, are restricted to about half their prewar size, although during a large part of the war period the publication of medical books was not seriously affected. Recently the difficulties have increased because of a shortage of labor as well as of paper. There are difficulties in the issue of new medical books and new editions. A big publishing firm, established over a hundred years, whose medical and dental books are known all over the world, complains that it is compelled to refuse overseas orders every week because of exhaustion of editions and because paper is unobtainable for reprints, even though the type is still stand-

ing. When the paper controller gives permission for the production of a new edition he sometimes restricts the number of copies, thus increasing the price at which they can be sold. The *Nursing Times* declares that the work in training schools for nurses is hampered by lack of essential textbooks. Publishers are restricted to a certain proportion of their prewar consumption. Such restriction does not exist for firms established during the war. The result is, important publishers complain, that they cannot produce valuable books because of paper restriction, while mushroom firms which have just sprung up can publish rubbish. No one may start a new periodical or open a new book shop without a permit, but any one can start a new publishing business.

The *British Medical Journal* complains that medical journals of the highest standing, already shrunk beyond recognition, were in 1942 compelled to choose between cutting down circulation and further cutting down pages. In the case of the *British Medical Journal* there was no alternative, because membership gives a right to a weekly copy and the number of members has risen by 6,000 since the outbreak of war to a total well over 44,000. The present supply of paper of the *Journal* is totally inadequate for the needs of the profession, and much valuable information is delayed at a time when quick diffusion of new ideas is of first importance. Lay newspapers have lately been allowed a better ration of paper, but medical journals have not.

The Benefits of Graduated Sun Bathing on a Troopship

The Army Medical Department *Bulletin* describes an experiment in graduated sun bathing recently carried out on board a troopship during an outward voyage through the tropics. Sun bathing parades were incorporated into the training program and the skin of every man was inspected by a medical officer before and after each parade. Care was taken to include all men employed below deck, such as orderly room clerks and mess waiters. During the first few days no man was allowed to expose himself to the sun except on these parades, and the wearing of helmets in the open was compulsory. On parade the front and back of the body and limbs were exposed for ten minutes on the first three days, for twenty minutes on the next three days, and then for half an hour daily for a week. After this, men who were tanned were allowed to sun bathe independently during the evening. At the end of three weeks, when most of the parades were discontinued, the men were not allowed to wear more than shorts all day, and helmets were no longer compulsory.

Special attention was paid to any deviation from normal reaction. Men with slight erythema were excused from parade for one day; those with severe erythema were excused for three days. Those who tanned unusually slowly were grouped in a separate parade under a medical officer. It was found that few men seemed to be hypersensitive to the actinic rays of the sun and that exposure was inadvisable for men with seborrheic dermatitis. Men with blond skin required extra care.

The author of the experiment, the senior medical officer of the troopship reports the following satisfactory results: (1) improvement in general health (average daily sick parade 1.5 per cent), (2) diminution of such skin disorders as impetigo, acne, scabies, tinea pedis and prickly heat, (3) low incidence of sunburn (2 cases) and of heat stroke (none), (4) relief of heavy strain on laundry facilities and (5) accelerated rate of acclimatization on arrival in a tropical country. The officer commanding the troops, in a warm tribute, states that on landing in India the men were sufficiently inured to the sun to take the field at once, while returning troops, some of whom had been in India eight years, were white of skin, sensitive to the sun and unable to work on deck without shirts and helmets. He concludes "The results of this valuable experiment admit of no argument."

BUENOS AIRES*(From Our Regular Correspondent)*

Nov. 1, 1943.

Medical Congresses

The second Inter-American Congress of Surgery and fifteenth Argentine Congress of Surgery took place in Buenos Aires October 11 to 15 with Dr. Oscar Capello presiding. There were fifty delegates from Pan American countries. Dr. Leo Eloesser of San Francisco was the delegate from the United States. The official topics were "Sulfonamide Therapy in Surgery," "Fractures of the Legs" and "Hyperthyroidism." Drs. Augusto A. Covaro, Enrique Lagomarsino, José Alberto Caeiro and Alejandro Ceballos, all of Buenos Aires, were official speakers. Dr. Lagomarsino based his article on personal observations of 1,143 fractures. He made special reference to the treatment of fractures, either closed or open and with or without complications. Special attention was directed to prevention and early therapy of gas gangrene and osteomyelitis in fractures. There were several sections on surgery, technical demonstrations of proctologic surgery and various specialties and a film on hydatidosis.

The first Inter-American Congress of Radiology was recently held in Buenos Aires. Dr. José F. Merlo Gómez presided.

Delegates to the congress resolved (1) to create an Inter-American College of Roentgenology in Buenos Aires, (2) to stimulate the creation of laws in Pan American countries to promote roentgenology and protect roentgenologists and (3) to provide for retirement of roentgenologists if they become victims of the practice of roentgenology.

At the close of the congress a monument in honor of Roentgen, Curie and the victims of roentgenology was unveiled in the Instituto Municipal de Radiología y Fisioterapia of Buenos Aires.

The fifth Argentine Congress of Obstetrics and Gynecology was recently held at the Faculty of Medicine of Buenos Aires. Dr. Frank R. Pasman was the president. The topics discussed were "Clinical Course and Treatment of Endometriosis," "Obstetric Endocrinology," "Treatment of Acute Puerperal Infection" and "Genital-Hypoplasia."

Medical Week

The first Medical Week on the History of Medicine was recently held at the Instituto de Historia de la Medicina of the Faculty of Medicine of Buenos Aires. Dr. Juan Ramón Beltrán was the president. The following speakers gave lectures and read papers on official topics: Angel H. Roffo, Buenos Aires, "History of Cancerology"; Dardo Corvalan Mendilaharsu, Buenos Aires, "The Faculty of Medicine of Buenos Aires in the Epoc of Rosas"; Leo Eloesser, San Francisco, "Pirate and Buccancer Surgeons"; Martín J. Becerra, Buenos Aires, "Edward Wilde's Generation"; Enrique de Gandia, Buenos Aires, "Origin of Syphilis in America"; Nicanor Palacios Costa, Buenos Aires, "Life and Work of Cosme Argerich"; Pablo Osvaldo Wolff, Buenos Aires, "Historical Aspect of Pharmacology," and José Arce, Buenos Aires, "Alejandro Posadas and His Work." There was also a special session on the history of pharmacy.

Poliomyelitis in 1942

The statistics of the Epidemiologic Department of the National Department of Hygiene show the following cases of poliomyelitis during the epidemic between October and December 1942: October 1 to 15, 4 cases; October 16 to 31, 11 cases; November 1 to 15, 38 cases; November 16 to 30, 117 cases; December 1 to 15, 146 cases, and December 16 to 31, 105 cases. There was a total of 421 patients in the period of three months; there were 406 cases among infants and 15 in children, adolescents and young adults. Two hundred and nine patients were boys and 196 were girls.

New Department of Public Health

A new National Department of Public Health and Social Assistance was created recently here. It includes the National Department of Hygiene, the Advisory Committee of Regional Hospitals, the National Institute of Nutrition, the Society of Beneficence of the Federal Capital, the National Centers of Social Assistance, the Department of Subsidies and all the national branches of the departments of Public Health and Hygiene. Dr. Eugenio A. Galli, mayor surgeon, R. A., was appointed president of the department. An honorary committee is carrying on some work looking toward incorporation in the new department of certain centers which are now branches of government departments. Dr. Galli suggested arrangements to give the benefits of social insurance to all Argentines.

Syphilis

Dr. Francisco Gerardo Russo is the head of a large venereal disease dispensary in Buenos Aires. He says that syphilologists have found that syphilis has increased recently. One hundred and thirty-one cases of primary syphilis and 99 cases of secondary syphilis were reported to the National Department of Public Health between January and September 1942, and 205 cases of primary syphilis and 130 cases of secondary syphilis were reported for the same period of 1943. Syphilis diminished greatly for the years 1939 and 1940 after establishment of venereal disease laws. Dr. Russo believes that the fulfillment of these laws demands strict supervision.

Brief News

The Argentine Congress of Medicine and the Pan American Week on Neuropsychiatry for 1944 were postponed. The "Dr. Rafael A. Bullrich Prize" was recently established with a fund of \$10,000, which was donated to the Academia Nacional de Medicina of Buenos Aires in homage to Dr. Bullrich, professor of clinical medicine of the Faculty of Medicine of Buenos Aires, who recently retired. The prize will consist of a gold medal, a diploma and a \$600 award. It will be given every two years for the best article on cardiology published during the two year period.

A donation of \$25,000 was recently given the Sociedad de Beneficencia of Buenos Aires for the construction of a pavilion for convalescents in one of the hospitals of the society.

The Hospital del Barrio Obrero was recently opened in Asunción, Paraguay. It was constructed with the cooperation of the Inter-American Service of Public Health.

The government of the United States offered a donation of \$500,000 to Uruguay for improvements in public health. The offering was made through Dr. John D. Long of the Pan American Sanitary Bureau of Washington, who recently visited Uruguay. Uruguay will contribute an additional fund of \$100,000 for the same purpose. The work on sanitation and public health in Uruguay will be carried on by American and Uruguayan specialized technicians.

Dr. Gonzalo Bosch was recently appointed regular professor of psychiatry of the Faculty of Medicine of Buenos Aires.

Marriages

HERMAN LAMAR SINGLETARY, Lake City, S. C., to Miss Martha Ann Newman of Charleston at Kingstree November 5.

MANNING LIONEL NELSON JR., North, S. C., to Miss Annie Elizabeth Howell of Ridgeway at Carlisle, Pa., August 14.

RICHARD COFFMAN SHRUM, Dayton, Va., to Miss Vennie Maurcen Parrott of Florence in New York November 6.

JOHN SCOTT SHAFFER, Wytheville, Va., to Miss Amanda Elizabeth McKnelly at Petersburg October 23.

GEORGE L. LESLIE, Howell, Mich., to Miss Hazel Wood of Pontiac, Mich., in Carlisle, Pa., November 5.

Deaths

Ambrose Francis Dowd, Newark, N. J.; University of Vermont College of Medicine, Burlington, 1910; member of the Medical Society of New Jersey, American Psychiatric Association and the National Committee for Mental Hygiene; served as president of the New Jersey Neuropsychiatric Association; served overseas in the neuropsychiatric division, medical corps, U. S. Army, during World War I; chairman of the medical advisory board of the Selective Service System; for many years member of the state board and department of institutions and agencies of control; consultant at the Irvington General Hospital, Irvington, St. Mary's Hospital, Orange, and the Presbyterian Hospital; on the staffs of the St. Michael's Hospital, St. James Hospital, Hospital and Home for Crippled Children and the American Legion Memorial Hospital; for two terms president of the medical staff of Hospital of St. Barnabas and for Women and Children; at one time medical director of the Newark City Hospital; died November 16, aged 56, of gastric ulcer.

George Franklin Shiels, Redwood City, Calif.; University of Edinburgh Faculty of Medicine, L.R.C.P. and L.R.C.S., Edinburgh, 1884; F.R.C.S., Edinburgh, Scotland, 1888; lecturer on medical jurisprudence, University of California, San Francisco, from 1890 to 1892 and professor of surgery from 1892 to 1898; professor of clinical surgery in the postgraduate department of the University of California from 1894 to 1898; assistant lecturer on surgery at the New York Polyclinic Medical School and Hospital from 1904 to 1906; professor of surgery at the Fordham University School of Medicine, New York, from 1905 to 1907; fellow of the American College of Surgeons; received medals and citations "for distinguished gallantry in action" during the Spanish-American War, the Philippine Insurrection and World War I; died in Palo Alto October 26, aged 80, of pneumonia.

Roy Parsons Forbes Ⓢ Denver; Western Reserve University School of Medicine, Cleveland, 1915; associate professor of pediatrics at the University of Colorado School of Medicine; specialist certified by the American Board of Pediatrics, Inc.; member of the House of Delegates of the American Medical Association in 1931; past president of the Denver Public Health Council; formerly vice president of the Denver Tuberculosis Society and the Colorado Tuberculosis Association; member of the American Academy of Pediatrics; a captain in the medical corps of the U. S. Army during World War I; served on the staffs of the Children's Hospital, National Jewish Hospital and St. Anthony's Hospital; author of "Health Record for Children"; died November 8, aged 55, of cerebral hemorrhage, hypertension and chronic nephritis.

Frank Hall Washburn Ⓢ Holden, Mass.; Tufts College Medical School, Boston, 1899; member of the American Society of Regional Anesthesia, Inc., American Urological Association, American College of Chest Physicians and the New England Roentgen Ray Society; fellow of the American College of Surgeons; chief of staff, Holden District Hospital, thoracic surgeon, Worcester County Sanatorium, Worcester, consulting surgeon, Rutland State Sanatorium, Rutland, and consultant in surgery and urology, Veterans Administration Facility, Rutland Heights; in 1931 delivered the George Washington Gay lecture at his alma mater; died in the New England Baptist Hospital, Boston, November 10, aged 72, of acute ileitis.

Willard John Stone Ⓢ Pasadena, Calif.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1901; member of the House of Delegates of the American Medical Association in 1918; member of the American Society for Clinical Investigation; fellow of the American College of Physicians; clinical professor of medicine at the University of Southern California School of Medicine, Los Angeles; served as a major in the medical corps of the U. S. Army during World War I; on the staff of the Huntington Memorial Hospital; author of "Bright's Disease and Arterial Hypertension"; died October 30, aged 66, of coronary thrombosis.

Young Wilhoite Haley, Nashville, Tenn.; Vanderbilt University School of Medicine, Nashville, 1897; member of the Tennessee State Medical Association; formerly professor of physiology and professor of materia medica and therapeutics in the dental department of Vanderbilt University; at one time chairman of the governing board of the Nashville General Hospital; formerly a member of the state examining board for nurses; for many years on the staff of St. Thomas Hospital; one of the founders and charter member of Protestant Hospital; died in Monteagle, Tenn., October 31, aged 69, of cerebral hemorrhage.

Allan Blanchard Stewart, Owatonna, Minn.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1891; member of the Minnesota State Medical Association; at one time mayor; fellow of the American College of Surgeons; served during World War I; major, medical reserve corps, U. S. Army, not on active duty; for many years physician and surgeon for the Minnesota state public schools; on the staff of the Owatonna City Hospital; died in St. Mary's Hospital, Rochester, October 31, aged 80, of heart block and chronic nephritis.

John Samuel Abney, Jackson, Miss.; Memphis (Tenn.) Hospital Medical College, 1905; died November 27, aged 67, of acute dilatation of the heart.

John Calvin Anderson Ⓢ Pittsburgh; University of Pittsburgh School of Medicine, 1913; specialist certified by the American Board of Otolaryngology; chief, nose and throat department, Columbia Hospital, Wilkesburg; died in the Allegheny General Hospital November 13, aged 60, of bronchogenic carcinoma of the right lung with metastases to the cerebellum and pons.

Vandiver L. Bell, Grand Rapids, Mich.; Eclectic Medical Institute, Cincinnati, 1907; died November 20, aged 70, of heart disease.

Alexander J. Berger, Arkansas City, Kan.; Milwaukee Medical College, 1906; member of the Kansas Medical Society; served during World War I; on the staff of the State Hospital for Epileptics, Parsons; died November 2, aged 59, of carcinoma.

Charles Delos Bo Dine Ⓢ Portland, Ore.; Northwestern University Medical School, Chicago, 1902; formerly assistant clinical professor of surgery at the University of Oregon Medical School; fellow of the American College of Surgeons; served during World War I; on the staff of the Emanuel Hospital, where he died October 18, aged 70, of injuries received in an automobile accident.

William Riley Brady, Seattle; University of Colorado School of Medicine, Denver, 1912; served during World War I; died in the Swedish Hospital, November 7, aged 59, of injuries received in an automobile accident.

Albert Franklin Brockman, Seattle; American Medical College, St. Louis, 1890; died October 10, aged 75, of coronary thrombosis.

George Spurgeon Bullock, Washington, D. C.; Meharry Medical College, Nashville, Tenn., 1938; died November 21, aged 31, in an automobile accident.

James Brandon Campbell Ⓢ Big Rapids, Mich.; Saginaw Valley Medical College, Saginaw, 1900; past president of the Mecosta-Oshtemo Counties Medical Society; formerly city commissioner, mayor and member of the board of supervisors; served as a captain in the medical corps of the U. S. Army during World War I; a trustee of the Ferris Institute for many years; on the staff of the Community Hospital; local surgeon for the Pennsylvania Railroad; a director of Citizens State Bank; died November 13, aged 69, of coronary occlusion.

Samuel Davidson Carrigan, Sandoval, Ill.; St. Louis University School of Medicine, 1905; member of the Illinois State Medical Society; served as coroner of Marion County; died in St. Mary's Hospital, Centralia, November 12, aged 61, of cerebral hemorrhage.

Harry Ray Carson, Phoenix, Ariz.; Northwestern University Medical School, Chicago, 1909; specialist certified by the American Board of Pediatrics, Inc.; member of the Arizona State Medical Association, American Society of Anesthetists, Inc., and the American Academy of Pediatrics; served on the staffs of St. Joseph's and Good Samaritan hospitals; died November 8, aged 58, of hypertensive heart disease.

Marshall Grant Clancy, Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1900; served as police department surgeon; died November 28, aged 75, of heart disease.

John Marvin Davis, Red Bank, N. J.; University of the City of New York Medical Department, New York, 1887; for many years surgeon for the Furness Bermuda Steamship Line; died November 20, aged 77, of coronary disease.

Daniel Lee Dean, Hardinsburg, Ind.; Hospital College of Medicine, Louisville, Ky., 1903; died in Madison November 4, aged 78, of cerebral hemorrhage.

Richard L. Figgins, New Orleans; New Orleans University Medical College, 1907; died November 10, aged 53, of hemorrhage and shock from a self-inflicted gunshot wound.

Julius Mansfield Foster ⊕ Valley Stream, N. Y.; Long Island College Hospital, Brooklyn, 1899; school physician; one of the founders and vice president of the Valley Stream National Bank; died suddenly November 15, aged 68, of heart disease.

William Arthur Henderson, Kansas City, Mo.; Missouri Medical College, St. Louis, 1888; died November 18, aged 86, of cardiovascular disease and hypertension.

Alexander Ayer Higgs, San Diego, Calif.; Eclectic Medical Institute, Cincinnati, 1896; member of the House of Delegates of the American Medical Association in 1911; died September 10, aged 73, of cerebral hemorrhage and arteriosclerosis.

Pierre C. Hoag, Schenectady, N. Y.; Albany Medical College, 1878; died in the Ellis Hospital October 29, aged 90, of carcinoma of the prostate, hypertrophy of the prostate, uremia and chronic interstitial nephritis.

Adam Kemble ⊕ Washington, D. C.; George Washington University School of Medicine, Washington, 1905; member of the American Urological Association; also a pharmacist; served during World War I; a member of the board of regents of the Sibley Hospital; died in Mount Carmel, Pa., November 12, aged 65, of carcinoma.

Harry E. Thomas Kemper ⊕ Elizabeth, N. J.; Georgetown University School of Medicine, Washington, D. C., 1928; medical consultant on compensation court matters in the state; on the staffs of St. Elizabeth's Hospital and the Alexian Brothers Hospital, where he died October 18, aged 38, of coronary thrombosis and pulmonary embolism.

Gustavus A. Lusk, Ripley, Tenn.; Vanderbilt University School of Medicine, Nashville, 1881; died October 20, aged 88, of shock from a fractured hip.

Ernest Everest Martin, Allen, Ky.; University of Louisville School of Medicine, 1925; on the staff of the Martin General Hospital, Martin; died October 21, aged 43, of a fractured skull received in a fall.

Thomas Addison McCann, Dayton, Ohio; Hahnemann Medical College and Hospital of Philadelphia, 1891; formerly a member and president of the Ohio State Medical Board; for many years chief of staff, Miami Valley Hospital; died November 7, aged 84, of carcinoma of the prostate.

George Sheppard Moore, Nashville, Tenn.; Northwestern University Medical School, Chicago, 1910; clinical director of the Veterans Administration Facility, Tuskegee, Ala., from 1924 to 1937; died in the George W. Hubbard Hospital of Meharry Medical College October 28, aged 60, of acute peritonitis due to peptic ulcer.

Charles Francis Morris, Oteen, N. C.; Indiana University School of Medicine, Indianapolis, 1909; served during World War I; on the staff of the Veterans Administration Facility; died in an Asheville hospital October 30, aged 60, of injuries received in an automobile accident.

Lewis Burrows Morton ⊕ Los Angeles; State University of Iowa College of Medicine, Iowa City, 1901; specialist certified by the American Board of Surgery; member of the Western Surgical Association and the Pacific Coast Surgical Association; fellow of the American College of Surgeons; served as president of the staff and for many years a member of the surgical staff of St. Vincent's Hospital; died October 19, aged 65, of carcinoma of the sigmoid colon with metastases to the liver.

John Francis Nelson, New York; Columbia University College of Physicians and Surgeons, New York, 1905; assistant clinical professor of surgery at the New York University College of Medicine; member of the Medical Society of the State of New York; died September 30, aged 62, of heart disease.

Harry G. Nickel, Boiling Springs, Pa.; Baltimore Medical College, 1898; member of the Medical Society of the State of Pennsylvania; on the associate staff of the Carlisle Hospital, Carlisle, where he died October 28, aged 70, of coronary occlusion.

George Washington Nihart, Petoskey, Mich.; Rush Medical College, Chicago, 1883; past president and secretary of the Emmet County Medical Society; at one time mayor of Mendon; for many years county coroner and city health officer; died October 16, aged 87, as the result of a fractured hip received in a fall.

Aloysius E. O'Flaherty, Los Angeles; Kansas City (Mo.) Medical College, 1898; on the staff of St. John's Hospital, Santa Monica, Calif.; at one time on the staff of the Soldiers' Home Hospital, Soldiers Home, Calif.; died October 7, aged 71, of intestinal obstruction.

Bert R. Parsons ⊕ Cortland, N. Y.; Eclectic Medical Institute, Cincinnati, 1899; treasurer of the Medical Society of the County of Cortland; chief of the obstetric service, Cortland County Hospital; died November 4, aged 71, of coronary occlusion.

William George Pullen, Corrigan, Texas; Memphis (Tenn.) Hospital Medical College, 1903; member of the State Medical Association of Texas; president of the Polk County Medical Society in 1931; served as health officer of Corrigan; a member of the Lions Club and a director of the Citizens State Bank; died recently, aged 75, of cerebral hemorrhage.

George D. Ruthven, Rochester, N. Y.; Trinity Medical College, Toronto, Ont., Canada, 1895; aged 74; died recently of bronchopneumonia.

William Alfred Shoemaker ⊕ St. Louis; University of Maryland School of Medicine, Baltimore, 1885; an Affiliate Fellow of the American Medical Association; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; formerly clinical professor of ophthalmology at the Washington University School of Medicine; consulting ophthalmologist, Evangelical Deaconess Hospital; died November 7, aged 83, of coronary thrombosis.

Lester Eugene Siemon, Cleveland; Cleveland University of Medicine and Surgery, 1896; formerly a member of the Ohio State Medical Board; at one time on the staff of the City Hospital; died in Tionesta, Pa., October 3, aged 75, of a self-inflicted bullet wound.

Frank Floyd Wagoner ⊕ Chicago; Rush Medical College, Chicago, 1925; on the staff of the Norwegian American Hospital, where he died November 3, aged 48, of heart disease.

DIED WHILE IN MILITARY SERVICE

Clarence Pennell Baxter, San Diego, Calif.; Tufts College Medical School, Boston, 1914; Army Medical School, 1917; member of the California Medical Association; commissioned a first lieutenant in the medical corps of the U. S. Army on Jan. 20, 1917 and promoted to the grade of major on March 28, 1918; honorably discharged on June 30, 1922; appointed a lieutenant colonel in the Officers' Reserve Corps on Jan. 12, 1925 and served as contract surgeon from September 1935 to January 1937; returned to active duty with the medical corps, Army of the United States, on Oct. 10, 1940 and assigned to the Canal Zone, where he died April 27, aged 52, of gangrene.

David Clithero, Los Angeles; College of Medical Evangelists, Loma Linda and Los Angeles, 1940; commissioned a first lieutenant, medical corps, Army of the United States, on Aug. 18, 1942; died in Clovis, N. M., August 22, aged 32.

Edmund Francis Corrigan, St. Paul; University of Minnesota Medical School, Minneapolis, 1940; served on the resident staff of the City of Detroit Receiving Hospital; commissioned a lieutenant (jg) in the medical corps of the U. S. Naval Reserve on July 7, 1942; died in the U. S. Naval Hospital, Seattle, February 16, aged 27, of Hodgkin's disease.

Frederic Francis De Metrovich ⊕ Fowler, Colo.; University of Colorado School of Medicine, Denver, 1934; member of the Illinois State Medical Society; specialist certified by the American Board of Pediatrics, Inc.; formerly instructor in pediatrics at the Northwestern University Medical School and on the staff of the Children's Memorial Hospital, Chicago; captain, medical corps, Army of the United States; died in the Southwest Pacific area November 21, aged 35, of malaria.

Paul Churchill Johnson, Montoursville, Pa.; Jefferson Medical College of Philadelphia, 1940; member of the Medical Society of the State of Pennsylvania; commissioned a first lieutenant in the medical corps, Army of the United States, on Sept. 9, 1942; died in Hazard, Ky., August 14, aged 28, in an aircraft accident.

Bernard Jay Rike, Pueblo, Colo.; University of Colorado School of Medicine, Denver, 1939; commissioned a first lieutenant in the medical reserve corps, U. S. Army, on May 29, 1939 and promoted to captain on Nov. 22, 1942; died in the Southwest Pacific January 7, aged 29, of typhus.

Bureau of Investigation

DANGEROUS TO HEALTH

When Used as Directed

[EDITORIAL NOTE—These abstracts concern preparations which were specifically declared by the Food and Drug Administration of the Federal Security Agency to be dangerous when used in accordance with the directions given on the label by the manufacturer. The abstracts that follow are given in the briefest possible form: (1) the name of the product; (2) the name of the manufacturer, shipper or consigner; (3) the date of shipment; (4) the composition; (5) the type of nostrum; (6) the reason for the charge of misbranding, and (7) the date of issuance of the Notice of Judgment.]

Goodwin's Laxative Cold Tablets and No. 48511-C Tablets.—Shipped in February and March 1941 by Sharp & Dolme, Philadelphia, as No. 48511-C Tablets to Read Drug and Chemical Company, Baltimore, and repackaged by them as Goodwin's Laxative Cold Tablets. Composition in each tablet acetanilid (approximately 2 grains), quinine sulfate ($\frac{1}{4}$ grain), podophyllin, capsicum and extract of belladonna. Repackaged tablets misbranded because dangerous to health when used in dosage and with frequency and duration suggested in labeling, further misbranded because terms "Goodwin's Laxative Cold Tablets" and "Effective in the Treatment of Colds. Relieves the Feverish Conditions which Accompany Colds" and "Keeps the Bowels Active" gave false impression that product was an effective treatment for colds. Also misbranded because amount of belladonna alkaloids present was not properly declared on label. Again misbranded because label did not adequately warn against use by children or in those pathological conditions wherein it might be dangerous to health or caution against unsafe dosage and duration of administration, since label gave no warning that use should be discontinued if a skin rash appeared, or that tablets should be used cautiously if dryness of throat occurred; that they should be discontinued if rapid pulse or blurring of the vision resulted; that they should not be taken by children, that frequent or continued use might be dangerous to health by causing serious blood disturbances, anemia, collapse, or dependence on the drug; that the preparation should not be taken by elderly persons except on competent advice; that frequent use might lead to dependence on laxatives to move the bowels, and (in the case of the bulk tablets) labeling did not warn against use of these tablets in the presence of abdominal pain, nausea, vomiting or other symptoms of appendicitis.—[D. D. N. J., F. D. C. 659, February 1943]

Interferin.—Keefer Laboratories, Chicago. Shipped Nov. 3 and 27, 1941. Composition (expressed in percentages) essentially potassium soap (approximately 11.3), sodium soap (approximately 12.5), potassium iodide (approximately 6), benzoic acid (0.4), fats and/or oils (0.4), alcohol and water. Adulterated because quality fell below that purported, since product was offered for use by injection into the uterus, thereby implying that it was sterile, whereas it was contaminated with viable bacteria of a disease-producing type. Misbranded because dangerous to health when used in dosage and with frequency and duration suggested in leaflet accompanying carton, as an abortifacient. Further misbranded because of label representation that product had proved its value in more than 5,000 cases without a single known fatality, that it had been developed after extensive research, offered very definite advantages over old methods and was efficacious and appropriate for several ovarian complications, as well as syphilis, blood, skin, kidney and cardiac ailments and tuberculosis of the lungs, endocrine disorders, organic and functional nervous system diseases, blindness and other eye conditions, ear troubles, caries, hereditary diseases such as insanity and epilepsy, and some other things.—[D. D. N. J., F. D. C. 657, February 1943]

Lambert's Powders.—Stanley Drug Company, Minneapolis. Shipped July 19, 1940. Composition: each powder contained $2\frac{1}{2}$ grains of acetanilid and salol, and 5 grains of aspirin. Misbranded because dangerous to health when used in the dosage or with the frequency or duration recommended in the labeling. Further misbranded because labeling failed to bear adequate warning that giving the product to children might be dangerous to health, or caution against unsafe dosage or methods or duration of administration, since labeling did not warn that frequent or continuous use of a product containing $2\frac{1}{2}$ grains of acetanilid per powder might cause serious blood disturbances, anemia, collapse, or a dependence on the drug. Further misbranded because statement on carton, "muscular aches and body pains, lumbago" was false and misleading, since it represented that the drug was efficacious in the treatment of such conditions, whereas it was not.—[D. D. N. J., F. D. C. 702, April 1943]

Voltamp Battery No. 7.—Voltamp Electric Manufacturing Company, Baltimore. Shipped April 25, 1941. A device containing batteries, an electric coil, and attachments for applying electric current to the body. Misbranded because dangerous to health when used with frequency or duration suggested in labeling for a long list of disorders, including aphasia, apoplexy, Bell's palsy, bladder paralysis, blindness, catalepsy, muscular cramps, poliomyelitis, tetanus, spinal meningitis, neuritis, baldness, cataract, menstrual troubles, anemia, dropsy, cystitis, corns, Bright's disease, St. Vitus' dance, diabetes, diphtheria, exophthalmic goiter, obesity, tonsillitis and varicose veins, that it would increase the supply of mother's milk, remove superfluous hair, rid the skin of blemishes, develop the bust and other shrunken parts, and permanently relieve constipation.—[D. D. N. J., F. D. C. 658, February 1943]

Correspondence

THE 9-9-9 PLAN FOR INTERNSHIPS AND RESIDENCIES

To the Editor:—The medical services of the Army and Navy are justly proud of the superb health record of our armed forces and of the even more remarkably low mortality rate in wounded soldiers and sailors. Part of this magnificent performance is due, of course, to the efficient organization of the medical services of the armed forces. A large share has resulted from the advances in medical knowledge of the past twenty-five years. It seems probable, however, that the major element in the achievements of the military medical services is the high standard of medical education in this country during the past quarter century. The doctors now serving the nation in a military capacity are almost all graduates of modern schools and many have had excellent opportunities for postgraduate education. Unless the men coming into active service know the fundamental principles of medicine, have been taught to keep abreast of advancing knowledge and by arduous and prolonged training have learned the application of their knowledge, the great advances in medicine and excellent organization cannot produce the efficient medical service which is being given to our armed forces at the present time.

The Army, the Navy and the country itself owe a large debt to the medical educators of the past twenty-five years, and particularly to those educators who have served on the Council on Medical Education and Hospitals of the American Medical Association. It is therefore disturbing to find that the Council has given its support to the promulgation of the so-called 9-9-9 plan for hospital internships and residencies. This action appeals to many medical educators as a real disservice to the armed forces. An opinion so diametrically opposed to that of the general staffs of the Army and Navy should not be expressed without good reasons.

In contrast to the finely trained personnel of the present armed services, it will not be long before the medical schools and hospitals are delivering to the Army and Navy men of a different stamp. They will be medical graduates who have seen nothing but hurried, incomplete, perhaps even at times ill advised medical service. A competent resident staff is not only a matter of numbers. There are also involved matters of training and experience. A resident of but eighteen months of training can in no sense set the example that a resident of three to five years of previous experience can set. Nor can he teach. Without adequate resident staffs, accurate and complete histories and physical examinations, close and careful observation of patients, conscientious supervision of student progress and the example of technical procedures carried out by men who know how cannot be preserved. The elaborate rituals of present day medicine are designed for the safety of the patient; but a second purpose of equal if not greater importance in teaching hospitals is to demonstrate to the medical student work well done. Without trained assistants in adequate numbers the good precepts of the classrooms will be more than offset by the much more impressive but unavoidable bad practice at the bedside. The frantically busy teacher cannot add to his increasing burden the task once borne by the thoroughly trained resident of teaching the student the details of patient care.

We are not alone in the conviction that undergraduates educated under the 9-9-9 program cannot be anything but poorly trained doctors with no real background for medical growth through the years. When the Army and the Navy get these men who have not been exposed to good example and for whom there has been no time for reflection, contemplation, reading, maturing, how long will the splendid military medical record stand? If this war ends shortly, much harm will be done, and if the war lasts long the results will be irremediable.

There would be no purpose in such sentiments as these unless a feasible alternative course could be seen. This communication is written in the firm conviction that, for the sake of ultimate victory and an America worth saving, the quality of medical education should be given top priority among those peacetime traditions to be preserved; and medical education is now seriously threatened.

Let us inquire what gains the armed forces are making at such cost. On Jan. 1, 1944 a group of young physicians will become available from the teaching hospitals for military service. It is hard for the outsider to estimate how many of these there will be who would not otherwise then enter the Army or Navy. Since there are only seventy-seven medical schools in this country, and since only a minor though important part of the house staffs from the teaching hospitals is being prematurely released, an estimate of the immediate increment to the Army and Navy would be 500 men. Since hospitals generally have already pared their staffs to a low figure, the number might be less. Compare these figures with the present military medical roster of perhaps 50,000. The additional immediate strengthening of the military services is obviously proportionally minute, at the outside probably not more than 1 per cent. Furthermore, this is only an immediate gain. No greater number of men will be available on Jan. 1, 1945 and later than would have been available if the 9-9-9 plan had not been imposed on teaching hospitals.

The preservation of trained house staffs in the teaching hospitals would make possible a passable education for undergraduate students in spite of the accelerated program and would furnish from the house staffs a leaven of well trained men for replacement in the armed services. These two things alone would pay dividends to the Army and Navy beyond computation. It would seem an elementary proposition that these compensations would enormously outweigh the relatively insignificant immediate gains.

No doubt the Council on Medical Education has considered the propositions made herein and has made its decision on well grounded reasons. Many conscientious medical educators would like a frank presentation from the Council of those reasons.

If nothing can be done to improve the present situation, the medical profession can be assured that its teachers will endeavor to do the best job they can in spite of almost insuperable handicaps to good teaching.

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[This statement was referred to the Council on Medical Education and Hospitals. The Council comments:]

To the Editor:—Every one interested in high standards of medical education and medical service both in the armed forces and in civilian practice shares with the correspondents their great concern over the wartime training of doctors. Curtailment of staff has multiplied the difficulties for remaining teachers. Uncertainty of the future has adversely affected student morale. A 30 per cent increase in annual medical school admissions and graduates has meant acceptance of some students whose qualifications may be open to question.

On purely educational grounds, it would be impossible to defend a nine month internship, which must be regarded as a wartime educational casualty. Reluctantly, and only after careful consideration of the advantages and disadvantages and weighing the possible alternatives, the Council has recognized the so-called 9-9-9 plan as the best available under present wartime conditions.

The plan conserves medical manpower for both military and civilian use. Each year approximately 7,000 men graduate from medical school under the accelerated program. Under the old plan, three months of their internships would overlap with the internships of the next class. The quality of instruction in the overlapping period was often inferior, adding considerably less than the equivalent of three months' time to the nine month non-overlapping period. On the other hand, under the 9-9-9 program about 3,000 of these men will be available three months early each year, or the equivalent of 750 physician-years annually. Seven hundred and fifty physicians represents the complement of medical officers for approximately 125,000 new troops.

The 9-9-9 program assures the deferment of assistant residents and residents, even though the period of additional training is less than the three or more years generally considered desirable, and readily attainable in peacetime.

The Council's opinion that the 9-9-9 program is the best that can be obtained under the circumstances is not "diametrically opposed to that of the general staffs of the Army and Navy." The 9-9-9 program was the only method of deferment of commissioned officers as assistant residents and residents on which agreement could be reached. If a one year internship was to be continued, hospitals would be forced to operate without any commissioned officers deferred as residents. It is better to have one third of the intern group continue for nine months as assistant residents and one sixth of the group for a second nine months as residents than to have no deferments for hospital service after the first year of internships. The latter was apparently the only alternative and was considered to be less desirable than the 9-9-9 program.

No one would differ with the educational principles pronounced by the correspondents. In wartime, educational standards must be preserved with but one qualification. There must also be a maximal contribution by medical education to winning the war. That contribution has already been and will continue to be of inestimable value, thanks to the efforts of teaching staffs operating under almost insurmountable difficulties.

REACTIONS AFTER SPINAL ANESTHESIA

To the Editor:—The editorial in THE JOURNAL, Oct. 9, 1943 entitled "Reactions After Spinal Puncture" interests me because of such reactions in connection with spinal anesthesia. These reactions, while rare of late years, after some considerable experience with spinal anesthesia are attributed by me primarily to an atraumatic puncture with a 20 gage spinal needle. The possible theories of the mechanism of these headaches is interesting but still largely academic.

Of only empirical value in their treatment but nonetheless immediate in alleviation of these headaches is the slow intravenous injection of 7½ grains (0.5 Gm.) of caffeine with sodium benzoate. One such injection results in complete cessation; rarely a second or third injection may be necessary at six hour intervals. There have never been any untoward reactions from this therapy in quite a number so treated for the past fifteen years.

This observation was reported by me some years ago in an article on spinal anesthesia published in the *American Journal of Obstetrics and Gynecology*. However, experience in the Army indicates that it is not generally known and was not mentioned in the editorial. I have inquired of several pharma-

cologists and physiologists as to the possible explanation of the action of caffeine with sodium benzoate without enlightenment.

An interesting companion article in this connection appears in the abstract section of the same issue of THE JOURNAL entitled "Caffeine Withdrawal Headaches," by Dreisbach and Pfeiffer (*J. Lab. & Clin. Med.* 28:1212 [July] 1943, abstr. THE JOURNAL, Oct. 9, 1943, p. 382).

HALL G. HOLDER, Lieutenant Colonel, M. C., A. U. S.

EMERGENCY MATERNAL AND INFANT CARE PLAN FOR WIVES AND CHILDREN OF ENLISTED MEN

To the Editor:—The widespread dissatisfaction with the management of the emergency maternal infant care plan for wives and babies of men in the armed forces by representatives of the Children's Bureau emphasizes the need for a committee, nationwide in scope and representation, to meet with government bureaus when they have to administer medical care programs. Could not the Council on Medical Service and Public Relations call together representatives of the various state medical societies and departments of public health to consider policies to be followed in the administration of such plans? Such a committee could offer its cooperation to the persons or bureau responsible for the administration of the program. If necessary, the committee could offer uniform nationwide opposition to ill considered schemes that might be put forward by the bureau. It would be difficult for any bureaucrat to ignore such a committee. Points of difference, if any arise, could be ironed out in friendly conference instead of by the present cumbersome plan of having each state fight its own battle without being too familiar with the feeling of the profession in other states. By offering such cooperation—and, if necessary, opposition—needlessly irksome regulations could be avoided. The profession could better protect the health and interests of those the law was designed to serve as well as its own interests. By the same maneuvers it could avoid the oft voiced criticism that the profession never offers anything but opposition to medical care programs.

JAMES H. HUTTON, M.D., Chicago.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

BOARDS OF MEDICAL EXAMINERS BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL, Dec. 25, page 1137.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: *Parts I and II.* Jan. 17-19. *Part III.* Various centers, January. Sec., Dr. J. S. Rodman, 225 S. 15th St., Philadelphia.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY: *Oral.* *Part II.* Chicago, June 12-16. Final date for filing application is March 12. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Written,* Various large cities, May 8. *Oral.* Chicago, June 9-10. Final date for filing application is April 1. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Part II.* May or June. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh 6, Pa.

AMERICAN BOARD OF OPHTHALMOLOGY: Chicago, October. Sec., Dr. John Green, 6830 Waterman Ave., St. Louis.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: *Written and Oral.* *Part II.* Chicago, Jan. 21-22. Sec., Dr. Guy A. Caldwell, 3503 Prytania St., New Orleans, La.

AMERICAN BOARD OF OTOLARYNGOLOGY: *Oral.* New York City, June 1-4. Sec., Dr. Dean M. Lierle, University Hospitals, Iowa City, Ia.

AMERICAN BOARD OF PEDIATRICS: *Written.* Locally, Feb. 4. *Oral.* Philadelphia, March 25-26, and San Francisco, May 6-7. Sec., Dr. C. A. Aldrich, 707 Fullerton Ave., Chicago.

AMERICAN BOARD OF SURGERY: *Written.* *Part I.* March 10. Final date for filing application is Jan. 1. Sec., Dr. J. Stewart Rodman, 225 S. 15th St., Philadelphia.

AMERICAN BOARD OF UROLOGY: *Oral.* Chicago, Feb. 15-17. Sec., Dr. Gilbert J. Thomas, 1409 Willow St., Minneapolis.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Hospitals: Property of Not for Profit Corporation Operated for Benefit of Individual Physicians Not Exempt from Taxation.—A Wisconsin statute provides exemption from taxation with respect to the property of any benevolent association used exclusively for the purposes of such association and which is not leased or otherwise used for pecuniary profit (Wisconsin Stats., sec. 70.11 [4]). This statute, the Supreme Court of Wisconsin held in two recent cases, *Prairie du Chien Sanitarium Co., Inc. v. City of Prairie du Chien*, 7 N. W. (2d) 832 and *Riverview Hospital v. City of Tomahawk*, 11 N. W. (2d) 188, does not grant tax exemption to a nonprofit hospital corporation to which has been conveyed a hospital previously operated for profit, where the hospital under the new corporate setup is used primarily for the greater profit and convenience of the physician that built and originally owned the hospital even though the hospital accepts all patients who apply regardless of their ability to pay and operates at a deficit, which is made good by the physician referred to.

In the *Prairie du Chien Sanitarium* case the *Prairie du Chien Sanitarium Company, Inc.*, was a successor corporation to a private corporation for profit and had conveyed to it a hospital previously owned by the corporation for profit. The members of the new corporation were Dr. and Mrs. Satter, Dr. Dessloch, a layman who acted as the business manager of the hospital, and three relatives of the Satters, who paid nothing for their membership. Drs. Satter and Dessloch by agreement with the new corporation had the exclusive right to perform surgery in the hospital. These physicians received no salaries from the hospital but were provided without cost with heated, unfurnished offices in the hospital, rent free, and one meal a day. In return they supervised without compensation the hospital and its personnel. About 30 per cent of the total number of cases treated in the hospital were county and municipal patients whom the hospital cared for under contract for less than cost. These patients were treated by Drs. Satter and Dessloch without charge. The other patients in the hospital were private patients of the two physicians and other physicians, who were charged regular rates, though about 10 per cent of the total number of all accounts were not collected, apparently because of inability on the part of the hospital to collect. The hospital corporation contended that its property was exempt from local taxation in a suit it instituted against the city of *Prairie du Chien* to recover taxes paid under protest. The trial court dismissed the complaint, and the hospital appealed to the Supreme Court of Wisconsin.

In view of the statute referred to relating to tax exemption, said the Supreme Court of Wisconsin, for the hospital's contention to be sustained it must appear that (1) the hospital is a benevolent association (2) the personal property of which is used exclusively for the purposes of the association and (3) the real and personal property of which is not used for pecuniary profit. The court then discussed tests to be applied to determine what constitutes a hospital a benevolent association. It is clear, said the court, that the fact that the articles of incorporation provide that the institution is benevolent and charitable is not controlling. The actual financial setup of the hospital is important. If the books of the corporation show a substantial profit, this is a circumstance tending to negative the idea of a benevolent institution. The fact that the hospital receives and is dependent on donations indicates a benevolent character, as does the fact that it takes all patients who apply, regardless of their ability to pay, or at least that it does take a fair number of charity patients. A final and most important test is whether the members of the corporation render services without compensation. Obviously neither a single test nor isolated answers to each of the questions posed will automatically determine when

a hospital is a benevolent association. The facts of each case must be regarded as a whole, and the substance of the scheme of operation as it exists must be examined.

The Prairie du Chien Sanitarium operated for the fiscal year ended March 31, 1941 at a loss of about \$388. It received donations from the members of the corporation only. Such donations, said the court, do not make a hospital a benevolent association. *Rogers Memorial Sanitarium v. Summit*, 228 Wis. 507, 279 N. W. 623. In the present case the individual physicians were making from \$7,500 to \$10,000 a year. The manager, another member of the corporation, was paid a salary of \$140 a month. The hospital alleged that it took all patients who applied, but so far as the record shows, said the court, the 10 per cent of the patients whose accounts were not collected and who were classified as neither private nor county patients were billed for regular charges and everything was done to collect these bills. The chief point relied on by the hospital to establish the benevolent character was that the physicians in charge of the hospital were not paid any salaries for their services as medical directors of the hospital or for the operations they performed on county patients and those patients who came to the hospital without their own physicians. Whether it is exact, answered the Supreme Court, to say that these physicians received no compensation for their services is doubtful. They received their offices in the hospital rent free as well as the use of the hospital facilities and one meal a day. Whether or not the compensation was of value equivalent to the services rendered, it is clear that there is not a complete absence of remuneration such as is found in the cases in which all the work in the hospital except medical services is performed by the members of a religious order.

This leads us, continued the court, to the second and third points as to whether or not the property is used exclusively for the purposes of the hospital corporation and whether it is used for pecuniary profit. A corporation claiming to be benevolent to qualify its property for exemption from taxation must use it so free from connection with profits accruing to those owning it as clearly to be a charitable institution. Hence the personal property, grounds and buildings of a hospital are not exempt when members of the owner association are using the hospital as an adjunct to their private practice in such a way that it becomes a source of substantial help in the matter of earnings to be derived from the practice of their profession. It seems clear that even if we assume that the hospital is a benevolent association the property is used as much to advance the individual fortunes of the surgeons who manage it as it is for charitable purposes. There can be little doubt that the hospital is maintained primarily for the greater convenience and profit of these physicians in the practice of their profession. The physicians may, and under their management and control of the hospital did, give without recovering pay therefor of their time and skill in caring for people who did not pay for such care, but by reason of the use of the hospital in relation to their private practice the benefits extended were those of the physicians and not a contribution to public welfare by a benevolent association. The Supreme Court accordingly held that the property of the hospital was subject to local taxation.

As has been indicated, a similar result was also reached in the Riverview Hospital case. In that case Dr. Henderson established and operated a hospital in Tomahawk. Later for a nominal consideration he conveyed the hospital property to a corporation organized as a nonstock, nonprofit corporation. The members of the newly formed corporation were Dr. Henderson, his wife and Dr. MacFarlane, a dentist and a friend of Dr. Henderson. In the articles of incorporation of the new corporation it was provided that members of the corporation were to receive no dividends or any pecuniary profit, and all profits, if any, were to be used solely in increasing the facilities of the hospital and in the reduction of rates. The hospital received all persons applying for admission without first making inquiry as to their ability to pay. In 1940 it operated at a loss of around \$3,000, which was made good by Dr. Henderson. The hospital corporation instituted action against the city of Tomahawk to recover taxes paid on its property under protest, and from a

judgment in favor of the hospital corporation the city of Tomahawk appealed to the Supreme Court of Wisconsin, which held the hospital corporation liable for taxation on the broad grounds advanced in the Prairie du Chien case.

While the setup in the Riverview Hospital case, the Supreme Court pointed out, was somewhat different than in the Prairie du Chien case, still the surrounding circumstances showing purpose, management and connection with private enterprise was such that the hospital was under the rule recognized in the Prairie du Chien case that "an association or corporation claiming to be benevolent, in order to qualify its property for exemption from taxation, must use it so free from connection with profits accruing to those owning it as clearly to be a charitable institution." The property of a hospital corporation, said the court, is not exempt from taxation when members of the owner organization are using it as "an adjunct to their private business in such a way that it becomes a substantial help in the matter of earnings to be derived from the practice of their profession." All that was said in the Prairie du Chien case covering the use made of the hospital by its owner and his control over it appeared in the Riverview Hospital case although in the latter case the hospital did not specifically grant to Dr. Henderson exclusive use of the operating room and provide for meals. However that may be, there was no doubt that the hospital was conducted and managed primarily for the greater income and profit of Dr. Henderson in the practice of his profession. The evidence showed that Dr. Henderson, owing to differences arising between himself and the only other hospital in Tomahawk, was without hospital facilities and he organized the Riverview Hospital, giving it the property involved. A charge was made for every patient entering the hospital, and every means was used to effect collection. At the time the corporation was formed, it adopted the fees originally fixed by Dr. Henderson when operating the hospital as an individual. It appeared that all deficits of the hospital were paid for by him. It also appeared from the incorporation proceedings that the organization was so arranged that the power to control the property was in Dr. Henderson. The control was not given irrevocably as a charity to a charitable or benevolent institution. The benefit conferred by the organization of the hospital, the court held, could not be said to be so much to the public and so little to the donor and corporate owners as to place it in the class of property covered by the tax exemption statute. It is not unusual, said the court, for professional men to fail in collecting a just fee for some of their effort. A profession is based on an ideal which comprehends service to mankind. While the loser may find solace in the thought that by reason of a patient's failure to pay his bill a contribution to charity has been made, the kindness granted cannot become a justification for exemption from taxation on the hospital in which the service was rendered. Accordingly, as in the Prairie du Chien case, the Supreme Court held that the Riverview Hospital corporation was subject to local taxation.—*Prairie du Chien Sanitarium Co., Inc. v. City of Prairie du Chien*, 7 N. W. (2d) 832 (Wis., 1943); *Riverview Hospital v. City of Tomahawk*, 11 N. W. (2d) 188 (Wis., 1943).

Society Proceedings

COMING MEETINGS

- Annual Congress on Industrial Health, Chicago, February 15-16. Dr. Carl M. Peterson, 535 N. Dearborn St., Chicago 10, Secretary.
- Annual Congress on Medical Education and Licensure, Chicago, February 14-15. Dr. Victor Johnson, 535 N. Dearborn St., Chicago 10, Secretary.
- American Academy of Orthopaedic Surgeons, Chicago, January 22-26. Dr. Myron O. Henry, 825 Nicollet Ave., Minneapolis, Secretary.
- Annual Forum on Allergy, St. Louis, Jan. 22-23. Dr. Jonathan Forman, 394 East Town St., Columbus, Ohio.
- Clinical Orthopaedic Society, Chicago, January 22-26. Dr. Myron O. Henry, 825 Nicollet Ave., Minneapolis, Secretary.
- Society of Surgeons of New Jersey, Atlantic City, January 29. Dr. Walter B. Mount, 21 Plymouth St., Montclair, N. J., Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1934 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Psychiatry, New York

100:159-300 (Sept.) 1943

- Spirogram in Certain Psychiatric Disorders. J. E. Finesinger.—p. 159.
Immaturity and Crime. R. S. Banay.—p. 170.
Bilateral Prefrontal Lobotomy: Survey. L. H. Ziegler.—p. 178.
Remarks on Problems of Psychosurgery. G. W. Kisker.—p. 180.
Insanity as Ground for Annulment or Divorce in English and American Law (1). W. E. McCurdy.—p. 185.
Rehabilitation of Epileptic Service Men. W. G. Lennox.—p. 202.
Dawn of Psychiatric Journalism. M. K. Andur.—p. 205.
Psychoneuroses Incidental to Preflight and Primary Flight Pilot Training. W. O. Klingman.—p. 217.
Prognostic Possibilities of Rorschach Method in Metrazol Therapy. W. W. Morris.—p. 222.
Approach to Psychologic Control Studies of Urinary Sex Hormones: Report on Three Menstrual Cycles. G. E. Daniels.—p. 231.

American Journal of Surgery, New York

62:1-144 (Oct.) 1943

- *Cranio cerebral Wounds: Exteriorization Method of Treatment. J. Browder.—p. 3.
*Post-Traumatic Psychosis in the Aged: Treatment with Sex Hormones. H. D. Cogswell and S. C. Davis.—p. 9.
Pentothal Sodium in Major Surgical Procedures. J. D. Holly.—p. 13.
Symptoms Following Cholecystectomy: Some Brief Clinical Notes. D. MacDonald.—p. 19.
Peripheral Arterial Embolism: Brachial Embolism Successfully Treated. R. D. Duncan and M. E. Myers.—p. 34.
Acute Gastrointestinal Perforations: Review of Metropolitan Hospital Series 1930-1941. E. J. McCabe and W. L. Mersheimer.—p. 39.
Perforating Wounds of Intestine: Satisfactory Method of Treatment for Wounds More Than Twenty-Four Hours Old. T. B. Noble Jr.—p. 50.
Diagnosis and Treatment of Obstruction of Small Intestine. L. C. Bennett.—p. 59.
Myometrial Mobilization. F. A. Kassebohm and M. J. Schreiber.—p. 65.
Major Resection for Functional Gastrointestinal Disease: Report and Evaluation of 2 Cases. A. Strelinger.—p. 72.
Theory and Therapy of Shock: Varied Fluid Injections. F. M. Allen.—p. 80.
Recurrent Incarceration of Left Interstitial Inguinal Hernia. L. A. Thunig.—p. 105.
Control of Postoperative Pain: Application of Cold to Operative Site. E. G. Krieg.—p. 114.
Use of Water Soluble Chlorophyll in Oral Sepsis: Experimental Study of 300 Cases. S. L. Goldberg.—p. 117.
Plastic Material in Medicine: Preliminary Report on Use of Lucite and Nylon Fabric in Orthopedic Surgery. M. S. Burman.—p. 124.

Cranio cerebral Wounds: Exteriorization Method of Treatment.—Browder has been applying for several years a method for neglected wounds of the brain which is patterned after the plan of exteriorization of brain abscess as recommended by King. This method prevents the formation of fungus cerebri. The scalp, bone, dura and brain are debrided and all softened cerebral tissue is removed by suction, hemostasis being secured by applying the electrocoagulating current to the metal tube of the sucker whenever a blood vessel is drawn into it. The dura should be cut away to the limits of the cerebral defect. After débridement, cerebrospinal fluid should be withdrawn through the spinal needle in order to reduce the possibility of cerebral herniation. After the cerebral cavity has been opened widely, the entire area is covered with a single layer handkerchief of mesh gauze (44 by 40 per square inch). Sulfanilamide crystals are blown on to the handkerchief lining the cavity. The cavity is then packed with $\frac{1}{2}$ inch gauze strips to the level of the scalp. The flaps of scalp are brought over the area and loosely approximated. A snug fitting dressing composed of wet, flat gauze held firmly in place by a skull cap should be applied to prevent herniation. The wound is not dressed for three to

five days. For dressing the patient is placed on his side, cerebrospinal fluid is withdrawn from the lumbar thecal sac, the wound is reopened and the gauze pack is removed. The cavity lined with the adherent gauze handkerchief is filled with full strength hydrogen peroxide and washed out with saline solution. This should be repeated three or four times before an attempt is made to loosen the handkerchief. The removal of the lining gauze at the first dressing is a slow and tedious procedure, but each dressing becomes less arduous. In about ten to twelve days the entire cavity is covered with granulation tissue, the surface of which must not be injured during dressings. Slowly the cerebral wound becomes smaller and finally, by gradual decrease in the amount of intracranial packing, the granulating surface rises to the level of the cranial vault. After epithelization becomes complete, plastic repair of the scalp and cranial defect may be carried out at a later date.

Sex Hormones in Post-Traumatic Psychosis in the Aged.—Cogswell and Davis point out that not infrequently a senile person placed in bed to recover after some form of trauma, often trivial, breaks down mentally or physically and dies. Many of these patients appear to be in excellent condition up to the time of their injury. Getting these people out of bed as soon as possible and allowing them to exercise is of value in preventing this syndrome. In many cases this cannot be allowed, owing to the nature of the patient's injury. The authors report that 3 patients showed mental symptoms following injuries confining them to bed. Because such mental symptoms were not seen in younger patients under similar conditions, gonadotropic substance was given, and the mental symptoms have disappeared.

American Journal of Tropical Medicine, Baltimore

23:475-568 (Sept.) 1943

- Laboratory Report on Clinical Syndrome Referred to as "Bullis Fever." H. R. Livesay and M. Pollard.—p. 475.
Complement Fixation Test in Diagnosis of Yellow Fever: Use of Infectious Mouse Brain as Antigen. E. H. Lennette and Alina Perlowagora.—p. 481.
Distribution of Yellow Fever in Colombia in Recent Years. H. H. Smith, G. Bevier and J. C. Bugher.—p. 505.
Biochemical Reactions, Cultural Characteristics and Growth Requirements of Trypanosoma Cruzi. H. A. Senekjic.—p. 523.
Heavy Density of Plasmodium Falciparum Parasites in Malaria: Report of Case. A. N. Springall.—p. 533.
Toxic Action of Latrodectus Mactans Bite and Its Treatment: Clinical and Experimental Studies. R. R. L. Sampayo.—p. 537.
Ectopic and Hepatic Human Fascioliasis. A. Neghme and M. Ossandon.—p. 545.
Relative Importance of Certain Factors in Low Temperature Preservation of Malaria Parasites. R. E. Maxwell and Ruth Edgett.—p. 551.

American Review of Soviet Medicine, New York

1:1-94 (Oct.) 1943

- Organization of Medical Care for Wounded. E. I. Smirnov.—p. 9.
Effect of Frostbite on Sympathetic Nervous System. N. N. Burdenko.—p. 15.
Time Element in Restorative Surgery of Peripheral Nerve Lesions. V. V. Lebedenko.—p. 23.
*Nerve Transplantation. N. I. Propper-Grashchenkov.—p. 28.
Spasokukotski's Method of Feeding Abdominal Wounds. P. A. Panikov.—p. 32.

Nerve Transplantation.—Propper-Grashchenkov discusses experiments on replacing defects in peripheral nerves, in particular the Ignatov method of utilizing human nerves taken from corpses and treated with solution of formaldehyde. Ignatov used corresponding nerves, so that the diameter of the nerves could be matched. During the Finnish war there were 13 cases of transplantation in which the defects were so large that direct contact of the severed nerves was impossible. One sciatic nerve defect amounted to 12 cm. There were cases of defects of the median, radial and ulnar nerves. Repeated chronaxia examinations were made; motor and sensory functions of the involved extremities were tested with electrometric instruments. Observations demonstrated that the implanted nerve acted as a dead tissue bridge, thereby assuring the regeneration of the nerve fibers. Usually, when motor and sensory functions are lost, a disturbance takes place in the circulation and perspiration of the extremity. It becomes cyanotic, clammy and often covered with ulcers. Every case of transplantation of the formaldehyde

treated nerve tissue showed an improvement in each of these dystrophic processes. The transplantation of human nerves in large peripheral nerve defects accelerates the regeneration and reestablishment of the lost motor, sensory and trophic functions and prevents the wounded from becoming invalids.

Archives of Internal Medicine, Chicago

72:429-564 (Oct.) 1943

- *Immune Serum Therapy for Oroya Fever. C. Howe.—p. 129.
Relation Between Hepatic and Plasma Concentrations of Vitamin A in Human Beings. H. Popper, F. Steigmann, K. A. Meyer and S. S. Zevin.—p. 439.
Changes in Optic Function and Ophthalmoscopic Picture: Observed in Four Patients of Eunuchoid Skeletal Type Who Were Being Treated with Orchic Extract. M. Kutscher.—p. 461.
*Acquired Hemolytic Anemia. V. R. Mason.—p. 471.
Therapeutic Observations in Cushing's Syndrome: Effect of Various Agents on Calcium, Phosphorus and Nitrogen Excretion in Patient with Pituitary Basophilism. W. H. Perloff, E. Rose and F. W. Sunderman.—p. 494.
*Cold Hemagglutination with Symmetrical Gangrene of Tips of Extremities: Report of Case. D. Stats and J. G. M. Bullowa.—p. 506.
Vascular Diseases: Ninth Annual Review. T. R. Van Dellen, G. de Takáts and G. W. Scupham.—p. 518.

Immune Serum Therapy for Oroya Fever.—According to Howe there have been numerous attempts at immune therapy with serum or transfusions of whole blood from patients convalescing or recovered from various stages of Carrión's disease. The few available reports are inconclusive and neither substantiate nor detract from the possibility that such forms of passive immunization may be beneficial in certain cases. Arsenical preparations have been tried with unconvincing effects. The present communication deals with 3 cases of Oroya fever in which hyperimmune rabbit serum containing a high titer of agglutinins for *Bartonella bacilliformis* was given in moderately large intravenous doses. Immune serum was produced in rabbits by the intravenous administration of large amounts of *Bartonella bacilliformis* both in the fresh and in the formaldehyde treated state. There was no dramatic change in the clinical picture in any of the 3 cases as a result of immune serum therapy except for the prompt appearance of the typical eruption in 1 case. In this case the time of eruption was earlier than is usual in untreated Oroya fever. It is thought that intravenous administration of immune rabbit serum may have caused an appreciable diminution in the percentage of erythrocytes infected with *Bartonella bacilliformis*. A comparison is made of these cases with 5 cases of severe untreated Oroya fever from Colombia. The reduction of visible erythrocyte infection appears to be much more gradual in these cases than in those in which immune serum was used in treatment.

Acquired Hemolytic Anemia.—Mason shows that the anemia produced by accelerated disintegration of red blood cells leading to jaundice, increased excretion of urobilinogen and moderate splenomegaly is often accompanied by morphologic alterations of the red cells and is usually classified as hemolytic anemia. He observed a number of patients with hemolytic icterus of unknown cause and with acute or a subacute course similar to cases reported by Vidal and by Chauffard. He has records of patients with chronic acquired hemolytic anemia of unknown cause whose disease began acutely and followed a course characterized by a continuous increased hemolysis and by recurrent severe crises of hemolysis similar to those seen in acute acquired hemolytic anemia. The 12 cases reported here were observed subsequent to 1916. The disease is relatively rare. The cases of acute or chronic hemolytic anemia of the acquired type are characterized by more or less rapid destruction of erythrocytes. Splenomegaly is constant. It is probable that the destruction of blood occurs chiefly in the spleen. There is a pseudomacrocytic blood picture, usually with a high color index. Large numbers of macrocytes and microspherocytes are present in the blood film during the hemolytic crises in the acute type of the disease or constantly in the chronic type of the disease. The red cells may show extreme osmotic fragility or they may be normally resistant to hypotonic saline solutions. This abnormality is not related to the number of spherocytes in the circulating blood. The blood may or may not contain autoagglutinins or autohemolysins. The disease is neither hereditary nor congenital, and no etiologic factor has been determined in any of the reported cases. The acute type of

the disease has been reported as Lederer's anemia. Subacute and chronic types are probably more frequent than is commonly believed. The disease may heal spontaneously, or it may be cured by transfusions or by splenectomy. The more chronic types of the disease may or may not be cured by the removal of the spleen. During the serious hemolytic crisis removal of the spleen may be life saving even if it does not lead to complete cure.

Cold Hemagglutination with Symmetrical Gangrene of Tips of Extremities.—Stats and Bullowa point out that the antigen-antibody reaction between human erythrocytes and serum in which hemagglutination is observed only at low temperatures (below 68 F.) occurs in diverse pathologic states, such as Raynaud's syndrome, acute and chronic acquired hemolytic anemias, trypanosomiasis, acute bacterial infections, cirrhosis of the liver, leukemia, pernicious anemia, lymphoblastomas and bland venous thrombosis. Its presence in low titer has been recorded in at least 95 per cent of normal persons. There is only one previous report of the occurrence of gangrene of the extremities due to the action of a cold hemagglutinin. In the case reported by the authors an American Negro aged 64 noticed, fifteen years before admission, tingling, burning and numbness of the tips of his fingers and toes on exposure to a low environmental temperature. Two weeks prior to admission the patient was exposed to a temperature of approximately 5 F. for about sixty minutes while waiting for a bus. During this time he was clad warmly. He spent most of the hour standing still. He observed the same tingling of his fingers and toes that he had experienced many times before, and the first urine passed was dark. On his admission to the hospital the tips of the fingers to the distal interphalangeal joints were tense, tender, painful and cool to touch. In the lower extremities all the arterial pulses were easily felt. Both feet were moderately edematous and tender. The patient could not move his toes, and they were insensitive to pain stimuli. The toes were exquisitely tender and cool to touch. Laboratory studies revealed (a) unilateral hemoglobinemia following exposure of a forearm to cold, (b) hemagglutination in the capillaries of the conjunctiva due to cold and (c) absence of syphilis or evidence of a hemolytic anemia. No cause could be found to explain the presence of the cold hemagglutinin. A discussion is presented of clinical conditions in which transient or permanent arterial insufficiency of the extremities occurs despite adequate pulsation and absence of disease of the peripheral arteries. All the cases of cold hemagglutination reported in the literature in association with arterial insufficiency of the extremities or hemoglobinuria are tabulated.

California and Western Medicine, San Francisco

59:155-204 (Sept.) 1943

- Virus Pneumonia: Etiologic Studies. M. D. Eaton.—p. 160.
Preemployment Examinations: Unusual Findings at Douglas Aircraft Corporation. W. S. Keate.—p. 162.
Chemotherapy: Its Role in Traumatic Surgery. T. E. Reynolds.—p. 164.
Large Vesical Calculus in Association with Gigantism. E. F. Nation.—p. 167.

59:205-252 (Oct.) 1943

- Lymphocytic Hyperplasia and "Spontaneous" Alimentary Lesions. A. W. Meyer.—p. 210.
New Transverse Low Abdominal Incision. L. S. Cherney.—p. 215.
Tropical Diseases. R. F. McLaughlin.—p. 218.
Virus Pneumonia: Review of Pathology. J. B. McNaught.—p. 220.
*Fecal Impaction: Report of Unusual Case. A. M. May and E. Torre.—p. 224.

Fecal Impaction.—May and Torre report an unusual case of fecal retention. A woman aged 52 had shown progressive enlargement of the abdomen over a period of two years. She was emaciated, but her abdomen was enlarged to the size of a full term pregnancy. She claimed to have had no bowel movement for a year and a half. Her statement could not be believed, and a large ovarian cyst was thought of. Operation revealed that the descending colon from the splenic flexure to the sigmoid had become enormously dilated with feces, the bowel wall thinned to a cystlike appearance. An incision was made into the distended bowel and approximately 5 gallons of inspissated fecal material was removed. Search was made for an obstructive growth but none could be found. A temporary loop colostomy

tomy above the distended bowel was established. The patient's recovery was uneventful. Because of the recovery and the ultimate restoration of normal bowel activity, the authors feel that this case was a true fecal impaction rather than a megacolon of the Hirschsprung type.

Indiana State Medical Assn. Journal, Indianapolis

36:535-576 (Oct.) 1943

- Vaginal Hysterectomy: Indications and a Method. J. M. Waugh.—p. 537.
Control of Tuberculosis in Industry. A. G. Kammer.—p. 541.
Control of Scarlet Fever in Indiana (Isolation and Quarantine). J. W. Jackson.—p. 544.

36:577-632 (Nov.) 1943

- Modern Treatment of Prostatic Cancer—Rational Basis for Delayed Hormone Therapy. R. M. Nesbit and R. H. Cummings.—p. 577.
Anatomical Dissection of Paul deKruif's Book "Kaiser Wakes the Doctors." F. T. Romberger.—p. 579.
Mass Typhoid Fever Immunization—Intradermal Method. M. Kamp.—p. 584.
Problems of Women in Industry. M. H. Kronenberg.—p. 586.
Intestinal Parasitism in Selected Groups of Rural Residents of Indiana. W. H. Headlee and W. B. Hopp.—p. 592.
Fatal Aspiration of Foreign Body (Vomiting and Aspiration of Stomach Contents: Downing). H. A. Kuhn.—p. 595.

Iowa State Medical Society Journal, Des Moines

33:455-496 (Oct.) 1943

- Tropical Diseases in Iowa in Postwar Era. J. A. Greene.—p. 455.
Treatment of Industrial Wounds. H. W. Meyerding.—p. 460.
Surgery in Medical Emergencies. A. C. Pfohl.—p. 464.
Epidemic of Typhoid Fever in Iowa: Food Borne Outbreak Caused by Small Colony Strain of *Eberthella Typhosa*. F. J. Condon and I. H. Borts.—p. 467.

33:497-542 (Nov.) 1943

- Industrial Medical Relationships. O. J. Johnson.—p. 497.
Serologic Reactions in Nonsyphilitic Individuals. M. E. Barnes, I. H. Borts, C. I. Miller and M. Pearl Spanwick.—p. 500.
Surgical and Clinical Contribution to Right Sided Pain. B. R. Weston.—p. 505.
Early Diagnosis and Treatment of Tuberculosis. P. O. Nelson.—p. 509.
Carcinoma of Transverse Colon in Boy of Sixteen. M. J. Moes and M. E. Dittmer.—p. 514.

Journal of Aviation Medicine, St. Paul

14:233-328 (Oct.) 1943

- Partial Pressures of Carbon Dioxide and Oxygen in Expired Air and Alveolar Air When Oxygen Is Breathed at Different Atmospheric Pressures. T. M. Carpenter and R. C. Lee.—p. 240.
*Value of Carbon Dioxide in Counteracting Effects of Low Oxygen. F. A. Gibbs, E. L. Gibbs, W. G. Lennox and L. F. Nims.—p. 250.
Effect of Fasting on Resistance to Anoxia. C. P. Leblond, J. Gross and H. Laugier.—p. 262.
Physiologically Induced Myocardial Ischemia as Test of Circulatory Efficiency as Applied to Selection of Pilots. W. M. Barlett.—p. 264.
Effect of Simulated Altitudes on Spinal Fluid and Venous Pressure of Dogs. A. M. Sutherland, N. J. Molumut and R. D. Brookes.—p. 280.
Medullary Hormone Content of Adrenals of White Rats Subjected to Low Atmospheric Pressure. W. Raab.—p. 284.
Importance of Vision in Aviation. E. M. F. Weaver.—p. 289.
Factors in Care of Flier. H. M. Turk.—p. 300.

Carbon Dioxide for Counteracting Effects of Low Oxygen.—A study of arterial and internal jugular blood and of brain function in 8 healthy young men who breathed mixtures containing low percentages of oxygen and varying rations of nitrogen and carbon dioxide revealed, according to Gibbs and his associates, that normal brain function can be maintained in spite of a low percentage of oxygen in the inspired air (as low as 2 per cent), provided the carbon dioxide tension of the body is maintained. The addition of carbon dioxide to low oxygen mixtures permits maximal utilization of the available oxygen because of (a) increased pulmonary ventilation and consequent increased oxygenation of the arterial blood, (b) peripheral vasoconstriction and cerebral vasodilatation, insuring to the brain a maximal share of the circulating blood, and (c) shift in the hemoglobin dissociation curve so that the blood unloads a greater proportion of its oxygen in the tissue. The improvement in the oxygen supply to the brain is only one aspect of the matter. The maintenance of the carbon dioxide tension of the brain is of equal importance for normal brain function. Gross cortical dysfunction manifested by high voltage slow activity in the electroencephalogram and by mental confusion

occurs when the carbon dioxide tension of the brain falls as a result of breathing low oxygen mixtures, even though the oxygen tension of the brain may be sufficient to maintain normal brain function. If the oxygen tension of the brain is lowered while the carbon dioxide tension of the brain is maintained, consciousness is lost without a preceding period of confusion and without the occurrence of high voltage slow waves in the electroencephalogram.

Journal of Bone and Joint Surgery, Boston

25:731-1004 (Oct.) 1943. Partial Index

- Subastragalar Arthrodesis in Fractures of Os Calcis. W. E. Gallie.—p. 731.
Internal and External Fixation of High Osteotomies of Femur. J. A. Key.—p. 737.
Spastic Paralysis and Allied Disorders. H. R. McCarroll and J. R. Schwartzmann.—p. 745.
Subtrochanteric Osteotomy. J. B. Kelley.—p. 768.
Treatment and Results in Localized Osteitis Fibrosa Cystica (Solitary Bone Cyst). A. D. McLachlin.—p. 777.
Experimental Staphylococemia and Hematogenous Osteomyelitis. J. B. Weaver and Mary Whelan Tyler.—p. 791.
Pathologic Gait in Residual Poliomyelitis. J. Hartley.—p. 803.
Internal Fixation of Metacarpal Fractures Exclusive of Thumb. E. F. Berkman and G. H. Miles.—p. 816.
Plantaris Muscle: Anatomic Study of 750 Specimens. E. H. Daseler and B. J. Anson.—p. 822.
Injuries of Pelvis. E. S. Leimbacher.—p. 828.
Use and Abuse of Anatomic Splint in Treatment of Fractures of Lower Extremity. R. Mazet Jr.—p. 839.
Method of Reducing Fracture Dislocations of Cervical Vertebrae, with Report of 2 Illustrative Cases. H. S. Morton.—p. 859.
Arthritis of Acromioclavicular Joint. A. Oppenheimer.—p. 867.
Neglected Femoral Fractures. L. T. Peterson.—p. 871.
Relationship of Legg-Perthes Disease to Function of Thyroid Gland. A. B. Gill.—p. 892.
Sarcomas of Hand Subsequent to Trauma. S. T. Snedecor.—p. 907.
Traumatic Separation of Lower Femoral Epiphysis. S. Sideman.—p. 913.

Journal of Immunology, Baltimore

47:283-352 (Oct.) 1943

- Immunologic Studies of Pollinosis: V. Enhanced Response in Hay Fever. Mary Hewitt Loveless.—p. 283.
Complement Fixation Test with Human Serums Against Viruses of St. Louis Encephalitis and Equine Encephalomyelitis. Beatrice F. Howitt.—p. 293.
Additional Studies of Inactivation of Virus of Epidemic Influenza by Soaps. C. C. Stock and T. Francis Jr.—p. 303.
Quantitative Determination of Antigen, Antibody and Complement in Precipitates. F. Haurowitz and M. M. Yenson.—p. 309.
Studies with H. Pertussis: XII. Separation of Agglutinin of B. Parapertussis from Other Cellular Components. A. Bondi Jr. and E. W. Florsdorf.—p. 315.
Inactivation of Phage by Aldehydes and Aldoses and Subsequent Reactivation. I. J. Kligler and E. Oleinik.—p. 325.
Combined Active-Passive Immunization Against Tetanus. H. Gold and H. Bachers.—p. 335.
Dermal Supersensitivity, Heat Labile and Heat Stable Antibody Against Ragweed in Cattle. A. J. Weil and L. Reddin Jr.—p. 345.

Journal of Lab. and Clinical Medicine, St. Louis

28:1535-1654 (Oct.) 1943

- Physics of Sound, with Particular Relation to Examination of Patient. E. M. Chapman and A. Goldstein.—p. 1535.
Effect of Tungsten Metal Diets in Rat. F. W. Kinard and J. van de Erve.—p. 1541.
Sulfathiazole and Staphylococcus Antitoxin in Experimental Staphylococcal Infection. E. Steinfeld, M. Brylawski and Carrie B. Nash.—p. 1544.
Carotid Sinus Syndrome: Report of Three Additional Cases from Cardiology Service, U. S. V. A. Facility, Columbia, South Carolina. S. L. Zimmerman.—p. 1548.
Influence of Muscular Work and Fatigue on State of Central Nervous System. E. Simonson, N. Enzer and R. W. Denton.—p. 1555.
Significance of Erythrocytic Pseudoagglutination. R. D. Barnard.—p. 1568.
Occurrence of Double Zone Phenomenon in Antihuman Tissue Serum. A. Nettleship.—p. 1572.
Hematology of Peripheral Blood and Bone Marrow of Dog. E. J. Van Loon and B. B. Clark, with technical assistance of Dorothy Blair.—p. 1575.
Effects of Sulfapyrazine and Sulfadiazine on Mice Infected with Hemolytic Streptococcus, Pneumococcus and Staphylococcus Aureus. G. W. Raiziss, Marie Severac and J. C. Moetsch.—p. 1580.
New Method for Evaluation of Drugs Affecting Reaction of Mice to Pain Stimulation. K. Kueter and R. K. Richards.—p. 1585.
Chronic Indurative Pneumonia Resulting from Cardiospasm: Case with Nonpathogenic Acid Fast Bacilli in Sputum. F. C. Warring Jr. and A. B. Rillance.—p. 1591.
Studies in Prothrombin: V. Arterial and Venous Plasma Prothrombin Time in Man. S. Shapiro.—p. 1596.

Journal of Nutrition, Philadelphia

26:327-442 (Oct.) 1943

- Field Peas as Source of Protein for Growth. Ella Woods, W. M. Beeson and D. W. Bolin.—p. 327.
- Ratio of Ascorbic Acid, Riboflavin and Thiamine in Raw and Pasteurized Milk. A. D. Holmes, C. P. Jones, Anne W. Wertz and J. W. Kuzmeski.—p. 337.
- Some Results of Feeding Rats a Human Diet Low in Thiamine and Riboflavin. G. M. Higgins, R. D. Williams, H. L. Mason and A. J. Gatz.—p. 347.
- Role of Biotin and "Folic Acid" in Nutrition of Rhesus Monkey. H. A. Waisman and C. A. Elvehjem.—p. 361.
- Losses of Vitamins in Large Scale Cookery. Christene A. Heller, C. M. McCay and C. B. Lyon.—p. 377.
- Adequacy of Industrial Lunch and Use of Brewers' Yeast as Supplement. Christene A. Heller, C. M. McCay and C. B. Lyon.—p. 385.
- Factors Influencing Bioassay of Vitamin E. B. R. Homrich.—p. 391.
- Performance of Normal Young Men on Controlled Thiamine Intakes. A. Keys, A. F. Henchel, O. Mickelsen and J. M. Brozek.—p. 399.
- Studies of Average American Diet: II. Riboflavin, Nicotinic Acid and Pantothenic Acid Content. V. H. Chelidelin and R. R. Williams.—p. 417.
- Mineral Composition of Albino Rat as Affected by Chloride Deficiency. E. J. Thacker.—p. 431.

Brewers' Yeast as Supplement to Industrial Lunch.

Heller and her collaborators sampled the noon meal served to workers in a cafeteria in the Brooklyn Navy Yard for the riboflavin, niacin and thiamine contents. It was found that this noon meal usually furnishes at most only one fourth of the day's requirements for these vitamins. Dry brewers' yeast has provided a satisfactory method of supplementing the supply of these vitamins. This yeast was usually incorporated in the meat dishes at conservative levels, so that the taste was not detected. Since yeast is rich in protein of good quality it also affords a good source of this dietary factor.

Journal of Urology, Baltimore

50:389-514 (Oct.) 1943

- Adenoma of Kidney with Associated Lesions: Report of 3 Cases. H. G. Bugbee.—p. 389.
- *Wilms Tumor of Kidney: Clinicopathologic Study of 44 Proved Cases. W. Weisel, M. B. Dockerty and J. T. Priestley.—p. 399.
- Infected Solitary Cyst of Kidney in Child, with Review of Literature. T. S. Chalkley and L. E. Sutton Jr.—p. 414.
- Ureteropelvic Obstruction Due to Extrinsic and Intrinsic Lesions of Ureter as Clinical Entity and Its Treatment. C. L. Deming.—p. 420.
- Technic and After-Care of Cystopuncture Using New Cystome. E. E. Ferguson and H. A. Trangsrud.—p. 432.
- Transurethral Surgery in Relation to Bilharziasis of Bladder. H. R. Newman.—p. 440.
- Simple Automatic Bladder Irrigator. E. Rupel and C. G. Culbertson.—p. 446.
- Use of Nonabsorbable Stay Sutures as Primary Means of Closure in Suprapubic Prostatectomy. W. F. Melick.—p. 449.
- Appraisal of Collateral Findings in Cases of Prostatism. J. A. Lazarus.—p. 458.
- Malignant Tumor of Interstitial Cells of Testis with Prostatic Carcinoma. J. G. Sharnoff and J. R. Lisa.—p. 471.
- Pistol Grip for Stern-McCarthy or Nesbit Resectoscope. H. J. Walder and M. P. Ersfeld.—p. 474.
- Tuberculous Reaction in Seminoma. M. Cohen and J. J. Lee.—p. 477.
- True Hermaphroditism: Case Report, with Interpretations. J. K. Lattimer, E. T. Engle and R. C. Yeaw.—p. 481.
- Treatment of Burns of External Genitalia. A. C. Drummond.—p. 497.
- Reciprocal Transfusions of Blood in Anuria: Report of Case. T. D. Slagle and J. A. Pons.—p. 503.
- Ideal Penile Anesthesia: Obtained by Injection of Corpora Cavernosa. M. A. Magid and O. S. Culp.—p. 508.

Wilms Tumor of Kidney.—Weisel and his associates studied records of 101 patients who were seen at the Mayo Clinic from 1904 to 1940 inclusive and whose condition was diagnosed as Wilms tumor, embryonal sarcoma, mixed tumor of the kidney or sarcoma of kidney. A careful weeding out revealed 44 Wilms tumors. Wilms tumor (embryonal carcinosarcoma of the kidney) is a malignant mixed tumor of the kidney seen primarily in childhood, but it can occur at any age. The most prominent clinical feature is an abdominal mass. Fever, emaciation and hematuria are common. The clinical course is progressive and as a rule rapidly downhill. The treatment of choice is prompt surgical extirpation combined in certain cases with preoperative irradiation and always followed by postoperative roentgen treatment. The majority of patients fail to survive one year. In the present series only 7 of the 44 patients were living two to twenty years after operation. The pathologic diagnosis of Wilms tumor depends on the find-

ing of glandular and stromal cells in a more or less characteristic mixed tumor arrangement. Other types of tissues, notably striated muscle, are found in about half of the cases. The origin of Wilms tumors is obscure.

Military Surgeon, Washington, D. C.

93:389-442 (Nov.) 1943

- Treatment of Burns at Army Air Forces Advanced Flying School. L. R. Weinschel.—p. 389.
- Different Concept of Reactions Following Sulfathiazole Readministration. R. C. Green, M. L. Steckel and J. M. Michener.—p. 399.
- Use of Plastics in Reconstructive Surgery: Lucite in Arthroplasty; Tissue Tolerance for Lucite; Its Use as Interposition Mold in Arthroplasty of Hip and of Phalangeal Joints; Report of 3 Cases. M. Burman and R. H. Abrahamson.—p. 405.
- Asthenopia and Amblyopia Caused by Congenital Lens-Vitreous Changes: Study of 25 Cases. A. B. Berkove.—p. 415.
- Effect of Acute Hepatitis on Renal Function. G. C. Prather, E. E. Ferguson and L. M. Rosati.—p. 418.
- Chronic Meningococcal Septicemia: Report of Case. J. S. Yoskalka.—p. 421.
- Mechanical Aid for Administration of Pentothal Sodium Intravenous Anesthesia. F. F. Rudder.—p. 426.
- Hookworm Infestation: Comparative Methods of Treatment. W. C. Wallace and D. T. Chamberlin.—p. 427.

Nebraska State Medical Journal, Lincoln

28:305-336 (Oct.) 1943

- Incisional Hernia. F. W. Bancroft.—p. 308.
- Diagnosis and Prevention of Rheumatic Recrudescences in Children. A. E. Hansen.—p. 314.
- Recent Advances in War Surgery. J. E. M. Thomson.—p. 317.
- Glaucoma—Short Résumé. W. H. Morrison.—p. 323.

28:337-368 (Nov.) 1943

- Bronchoscopy as Diagnostic and Therapeutic Procedure. S. Iglauer.—p. 340.
- Present Status of Liver Tests. L. T. Hall.—p. 345.
- Further Observations on Lanatoside C. M. Margolin.—p. 348.
- Rupture of Urethra Associated with Fracture of Pelvis. P. Adams.—p. 351.
- Treatment of Gonorrheal Vulvovaginitis with Estrogens. W. E. Brown.—p. 354.
- Undulant Fever in Nebraska and Its Diagnosis. L. O. Vose.—p. 359.

New York State Journal of Medicine, New York

43:1903-2014 (Oct. 15) 1943

- Clinical Syndrome in Children Resembling Rheumatic Fever. A. D. Kaiser.—p. 1937.
- Prevention of Rheumatic Recurrences: Discussion of Various Measures Now Being Used. Ann G. Kuttner.—p. 1941.
- Potentialities in School for Rheumatic Fever Control. G. M. Wheatley.—p. 1947.
- Effective Use of Thyroid in Periodic Paralysis. A. Wolf.—p. 1951.
- Clinical Use of Adrenal Cortical Hormones: Preliminary Report. J. H. Lapin, S. F. Goldman and A. Goldman.—p. 1964.
- *Incidence of Gross Renal Lesions in Cases of Hypertension. P. W. Aschner, B. S. Epstein and H. Mandelbaum.—p. 1970.
- Anesthesia for Thoracic Surgery. B. Etsten.—p. 1980.
- Three New Tools of Science. D. F. Winnek.—p. 1986.

Renal Lesions in Hypertension.—Aschner and his associates describe their urographic studies on 100 patients with hypertension and present illustrative case reports on renal lesions in hypertensive patients. They feel that in view of the newer knowledge of arterial hypertensive disease internists should insist on a urologic study of all such patients, excretion urography being the minimal requirement. Urologists should give more attention to the blood pressure trends in their patients in order to detect incipient hypertension and evaluate its relationship to the urologic disorder. Pathologists should study the main renal vessels in kidneys removed at operation and obtained post mortem. Discovery of obstructive uropathies in their early stages is the duty of every practitioner. The exhibition of the newer urinary antiseptics (mandelates, sulfonamides) may materially lessen the incidence of progressive pyelonephritis. The relationship of a unilateral renal lesion to coexistent hypertension is an individual problem. In occasional instances it is a definite etiologic factor, in some instances it is contributory, in most it is coincidental. The decision regarding nephrectomy in hypertensive patients should be based on the nature of the renal lesion alone, with due reference to consideration of conservation of renal tissue which may later stand the patient in

good stead. When the causal relationship of a unilateral renal lesion to hypertension seems probable, early recognition of this relationship, with prompt nephrectomy, enhances the likelihood of a good result.

Radiology, Syracuse, N. Y.

41:315-420 (Oct.) 1943

- Some Aspects of Teaching of Radiologic Physics. Edith H. Quimby —p. 315
Limitations of Physics in Radium Therapy H. M. Parker.—p. 330
Some Recent Applications of Nuclear Physics. J. M. Cork.—p. 337.
Differential Tissue Response to Neutron and Roentgen Radiations I. Lampe and F. J. Hodges.—p. 344
X Rays in Curable Heart Disease. M. C. Sosman.—p. 351.
Diverticulum of Bladder: Method of Roentgen Examination and Roentgen and Clinical Findings in 200 Cases W. Hartung and R. H. Flocks.—p. 363.
Review of Carcinoma of Bladder Treated by Supervoltage X-Rays over Five Year Period F. H. Colby and M. D. Schulz.—p. 371.
Roentgenologic Diagnosis of Parasternal Omental Hernia. L. L. Robbins.—p. 378.
*Treatment of Radiation Sickness with Vitamin B₆ (Pyridoxine Hydrochloride). J. R. Maxfield Jr., A. J. McIlwain and J. E. Robertson.—p. 383.

Vitamin B₆ (Pyridoxine Hydrochloride) in Radiation Sickness.—Maxfield and his associates call attention to the great variation in the reaction to radiation therapy. Its severity is apparently dependent on some inherent susceptibility in the patient. A patient suffering from malnutrition, debilitation and avitaminosis will usually not tolerate radiation therapy as well as a patient in good nutritional balance. There are many patients in whom vitamin B₁ and vitamin B complex are not effective. The authors administered 25 mg. of pyridoxine hydrochloride intravenously to patients in whom a definite radiation sickness was present. In most instances only one injection was necessary to stop the unfavorable symptoms. The authors recommend that 25 mg. be given intravenously immediately after the onset of radiation sickness and repeated at intervals of twenty-four to seventy-two hours as needed. The results have been most gratifying in a series of over 50 cases. Vitamin B₆ should supplement and not replace other methods. The use of liver extract, a high vitamin intake and sedatives is to be encouraged.

Review of Gastroenterology, New York

10:233-278 (Sept.-Oct.) 1943

- Role of Food Allergy in Hypertension Experimental Study A. S. Price.—p. 233.
Anatomic Basis for Study of Splanchnoptosis Paths of Ascent to Erect Position from Birth to Fourth Year of Life and Their Relation to Splanchnoptosis and Body Form and Body Cavities Agnes C. Viator.—p. 245
Rate of Operated Gallbladder Patient, with Diagnostic, Roentgenological and Clinical Notes and Follow-Up Studies L. Frank and C. E. Staats.—p. 254.
Influence and Danger of Latent Hepatic Disease in Operation on Gallbladder and Biliary Tract A. O. Wilensky.—p. 268

Rocky Mountain Medical Journal, Denver

40:569-640 (Sept.) 1943

- Management of War Injuries of Chest R. H. Meade Jr.—p. 586
Social Hygiene in War. W. Clarke.—p. 591
Report of Meeting of Medical Service Plans Council of America, Chicago, Illinois, June 6, 1943. W. W. King.—p. 596

40:641-712 (Oct.) 1943

- Wagner-Murray Dingell Bill G. P. Lingenfelter.—p. 658
Importance of Proctoscopy in Diagnosis and Treatment of Lower Bowel H. R. Reichman.—p. 660
Methods of Mortality Reduction in Amputations for Arteriosclerotic Gangrene L. H. Segerberg.—p. 663
Ureterocele. F. Mayner.—p. 665

Texas State Journal of Medicine, Fort Worth

39:323-364 (Oct.) 1943

- Meningitis Caused by Bacillus Haemophilus Influenzae One Hundred Per Cent Recovery in Series of Four Cases R. L. Nelson.—p. 327.
Eczematous Dermatitis Following Use of Sulfonamide Drugs on Skin J. B. Howell.—p. 331.
Liposarcoma Report of Case. J. Daly.—p. 332
Primary Malignancies of Vaginal Wall Two Case Reports J. Furman.—p. 335.
Abdominal Pain During Pregnancy H. L. Gardner.—p. 336
Fallopian Tube Visualization. J. H. Robberson.—p. 340
Management of Chlazia. M. Thomas.—p. 347.
Oil Nose Drops M. P. Spearman.—p. 350
Subnormal Child: Education for Social Living J. T. Dailey.—p. 352

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted

British Heart Journal, London

5:121-182 (July) 1943

- Bacterial Aneurysm. E. N. Chamberlain.—p. 121.
Heart Changes in Alkalosis. J. S. Lawrence and E. N. Allott.—p. 128
*Effects of Plasmochin, Atabrine and Quinine on Electrocardiogram H. L. Heimann and B. G. Shapiro.—p. 131.
Subendocardial Infarction: Case. R. K. Price and L. R. Janes.—p. 134.
Extreme Cardiac Hypertrophy: Report of 2 Cases with Aortic Hypoplasia and Endocrine Disorders. W. T. Cooke and P. C. P. Cloake.—p. 139.
Eisenmenger's Complex. A. J. Glazebrook.—p. 147.
Casual and Basal Blood Pressures: I. In British and Egyptian Men G. M. Alam and F. H. Smirk.—p. 152.
Id.: II. In Essential Hypertension. G. M. Alam and F. H. Smirk.—p. 156.
Id.: III. In Renal Hypertension M. Gatman, M. Amin and F. H. Smirk.—p. 161.
Latent Heart Block. M. Campbell.—p. 163.

Effects of Plasmochin, Atabrine and Quinine on Electrocardiogram.—Heimann and Shapiro observed that leads 4 R and 4 F showed changes of the coronary type in a soldier aged 22 who complained of precordial pain while receiving plasmochin. Observations on convalescent malaria patients showed that plasmochin increased the amplitude of the various deflections, affecting the T wave most constantly. In some cases the most striking feature was the effect on the S-T segment which simulates the cardiogram of coronary thrombosis. Atabrine decreased the amplitude of the various deflections, also affecting the T wave most noticeably and constantly. It restored the S-T segment to the isoelectric level after it had been elevated by plasmochin. Quinine had an effect similar to atabrine but to a lesser degree. Differentiation between the effects of plasmochin on the one hand, and of atabrine and quinine on the other, in a particular patient may be made on the electrocardiographic findings. Plasmochin increased the size of the T wave above normal while quinine and atabrine decreased it below normal. Plasmochin often has an effect on the S-T segment, as described; this is not seen in the exhibition of either of the other two drugs.

British Journal of Ophthalmology, London

27:431-476 (Oct.) 1943

- Significance of Distribution Ratios of Nonelectrolytes Between Plasma and Intraocular Fluid. S. Duke-Elder and H. Davson.—p. 431.
Detection and Significance of Melanophore Expanding Substance in Urine and Blood with Special Reference to Retinitis Pigmentosa J. R. Mutch and D. MacKay.—p. 434.
War Injuries of Eye: Traumatic Proliferative Choroiditis Due to Double Penetrating Foreign Body. I. C. Michelson and J. Kraus.—p. 449.
Subhyaloid Hemorrhage Following T. A. B. Inoculation. J. P. F. Lloyd.—p. 461.
Dissection of Traumatic Hyaloid Diaphragm, March, 1941. J. Foster.—p. 462.
*Herpes Zoster Ophthalmicus—Two Rare Manifestations T. G. W. Parry and G. C. Laszlo.—p. 465.
Rehabilitation of Unocular Patient. C. G. Schurr.—p. 467.
Iridocyclitis and Choroiditis Due to "Silent" Sinusitis Rosa Ford.—p. 469.

Herpes Zoster Ophthalmicus.—Parry and Laszlo direct attention to the occurrence of various ophthalmic conditions caused by herpes zoster. A woman aged 52 had an attack of herpes zoster along the ophthalmic branch of the right fifth nerve six weeks previously. The cornea was not involved, but there was a skin eruption with severe pain. Three and a half weeks after the eruption she suddenly lost sight in her right eye. The disorder was diagnosed as acute retrobulbar neuritis. After five weeks the visual acuity of the patient had improved. A man aged 33 had had "shingles" on his chest. Three weeks later he felt giddy and had double vision. Examination revealed paresis of the right abducent nerve. The condition gradually cleared up. The few existing statistics on the late ophthalmic involvements in herpes zoster reveal that they occur in the

following order of frequency: iridocyclitis (usually a complication with keratitis), optic neuritis and paralysis of the third, fourth and sixth cranial nerves. Retrobulbar neuritis has not been previously mentioned as a signal of herpes zoster.

Edinburgh Medical Journal

50:513-576 (Sept.) 1943

- Diverticulum of Urinary Bladder: Series of 22 Cases. A. J. C. Hamilton.—p. 513.
Infection in Newborn. J. L. Henderson.—p. 535.
*Observations on 80 Consecutive Cases of Internal Pneumonolysis. R. S. Barclay.—p. 554.
James Barry—1792 (?)—1865 Inspector General of Army Hospitals. M. P. Russell.—p. 558.

Internal Pneumonolysis.—Barclay reports 103 thoracoscopies which were performed on 80 patients. There were two types of cases. One group included 57 patients in whom the cavity was held out by adhesions. Another group included 23 patients in whom adhesions prevented a concentric collapse of the lung which still contained active disease. In the first group the adhesions had to be divided because the pneumothorax was ineffective; in the second group continued traction exerted by the adhesions resulted in premature reexpansion of the lung. The method used was double puncture under local anesthesia. The author used the cautery alone and never encountered troublesome bleeding. In 50 of the patients complete division was effected and the disease was controlled; in 8 patients division was incomplete but the disease was nevertheless controlled; in 12 patients the disease remained uncontrolled because of incomplete division; in the remaining 10 patients it was not possible to cut the adhesions because of fusion of the lung with the chest wall. There were no deaths, and the patients were little upset by the intervention. Apart from 1 patient who developed a purulent effusion, the only complication encountered was a serous effusion, which occurred in 10 per cent of the patients. Section of adhesions converted over 70 per cent of unsatisfactory type of pneumothorax into a satisfactory type.

Lancet, London

2:433-464 (Oct. 9) 1943

- Arthritis in Poliomyelitis. F. J. Poynton.—p. 433.
Streptococcal Meningitis Treated with Penicillin: Measurement of Bacteriostatic Power of Blood and Cerebrospinal Fluid. A. Fleming.—p. 434.
Mechanics of Head Injuries. A. H. S. Holbourn.—p. 438.
Effects of Drinking Small Quantities of Sea Water: Experimental Study. W. S. S. Ladell.—p. 441.
*Pneumonitis Associated with Autohemagglutination. S. Shone and R. Passmore.—p. 445.
Urinary Tract Infections in Royal Navy. J. Shafar.—p. 446.

Pneumonitis Associated with Autohemagglutination.—Shone and Passmore report observations on 54 consecutive cases of pneumonitis which occurred among Indian troops shortly after their arrival in the Middle East. The cases are divided into four groups: (1) atypical pneumonia, (2) short fever with cough and persistent lung signs, (3) afebrile laryngitis with little or no lung involvement and (4) proved malaria or splenomegaly with laryngeal or lung involvement. While investigating 1 of these cases of fever the authors observed that when a drop of blood was placed on a slide the red corpuscles immediately separated into clumps. An investigation in the medical wards led to the recognition of the described group of cases in which the predominant clinical features were fever and cough, the latter often associated with vomiting, hoarseness of voice and the presence of fine crepitations in the lungs: all showed the phenomenon of agglutination of red corpuscles. The men had been in camp near Delhi, where the incidence of fresh malarial attacks was high and some of them were still suffering from the effects of this disease. The authors sought for autohemagglutination in 331 Indian troops other than those with pneumonitis. The incidence was particularly high in patients with malaria. Many rickettsial infections involve the lungs, setting up a pneumonitis or interstitial pneumonia, and it is therefore relevant that all the patients examined were heavily infested with lice. The association of chronic malaria with so

many of the cases must suggest the possibility of a malarial basis for the disease, but an outbreak of malarial pneumonitis is outside all previous experience.

Medical Journal of Australia, Sydney

2:221-240 (Sept. 18) 1943

- With the Australian Army Medical Corps in Two Sieges: Anzac and Tobruk. C. Morlet.—p. 221.
Pathogenicity of Washed Clostridium Welchii and Mode of Development of Clostridium Welchii Infections in Man. Mildred M. Butler.—p. 224.
*Concentration and Drying of Serum for Intravenous Use. Marjorie Bick.—p. 227.

Concentration and Drying of Serum for Intravenous Use.—Bick describes a method of drying serum by precipitation of the serum proteins with alcohol and ether after preliminary concentration in cellophane casings. This process, which is known as hardyization, gives a finely divided product which can be dissolved readily, giving a perfectly clear reconstituted serum. The method so far has been used for drying 600 cubic centimeter lots of serum. No difference was observed between the serum protein concentration, the serum titer or group specific reducing power of the wet serum and that of dried serum reconstituted to its original volume. The advantages of this method of drying serum are the appearance of the product, the ease with which the dried serum can be reconstituted and the clearness of the reconstituted fluid. This clearness is due partly to the absence of fat and other lipoid material but also to the absence of denaturation of the protein. If the solvent is not properly cooled and the serum is not added slowly, a product which is hard to dissolve and gives a turbid reconstituted fluid may be obtained. The disadvantages of this method are the cost of the large volumes of ether used and the difficulty of transferring aseptically the dried product from the funnel to the bottle in which it is stored and reconstituted before administration. Since January 1941 90 pints of serum has been dried by this method, of which 80 has been reconstituted and given to patients. No unfavorable reactions were recorded. The reconstituted serum was invariably found to be sterile. Economy of solvent is effected by the preliminary concentration of the serum to one third of its original volume in cellophane casings. There appears to be no great difficulty in recovering the ether if the process is carried out on a large scale.

Helvetica Medica Acta, Basel

10:263-544 (June) 1943. Partial Index

- Pericardiac Thoracotomy and Hepatopexy in Ascites Caused by Adhesive Pericarditis. H. Curchod.—p. 269.
Surgical Treatment of Bleeding Gastric Ulcer. G. Neff.—p. 281.
*Clinical Aspects and Therapy of Mobile Duodenum. C. F. Geigy.—p. 303.
Cholecystenterostomy. A. Lehner.—p. 309.
Pneumatosis Cystoides Intestinalis. E. Ruppanner.—p. 313.
Implantation of Ureter According to Coffey in Ectopy of Bladder. E. Hagenbach.—p. 321.
Diagnosis and Surgical Therapy of Internal Vesical Fistulas. R. Allemann.—p. 329.
Surgical Treatment of Trigeminal Neuralgia. J. Rossier.—p. 331.
Treatment of Phlebitis by Infiltration of Lumbar Sympathetic with Procaine Hydrochloride. R. Koenig.—p. 337.
Securing Position of Surgically Treated Hallux Valgus and Other Foot Deformities by Means of Wiring Toe and Metatarsus. C. Henschen.—p. 351.
*Treatment of Habitual Shoulder Dislocation by Means of Metal Barrier Secured on Neck of Scapula and Coracoid Process. R. Ramser.—p. 377.

Mobile Duodenum.—Geigy observed in 1940 and 1941 5 patients with mobile duodenum who required surgical treatment because of severe and recurrent complaints. Mobile duodenum must be differentiated from ptosis of the duodenum which is caused by looseness of the retroperitoneal tissue. It is the result of a congenital malformation. It may be caused by failure (1) of the anterior loop to rotate around the vertical axis, (2) of the pyloric antrum and of the pars superior duodeni to rotate clockwise around its sagittal axis or (3) of the umbilical loop to rotate counterclockwise around the sagittal axis. The result is absence of duodenojejunal flexure. The

condition may also be caused by a lack of fixation of the duodenum to the posterior abdominal wall. Total mobile duodenum is comparatively rare. The majority of cases of mobile duodenum involve the superior part. As long as duodenal passage and bile discharge are not impaired, mobile duodenum is merely an anatomic defect which may be accidentally discovered by the roentgenologist. If symptoms develop, a mild dyspepsia, cholecystitis or duodenal ulcer may be simulated. The patients complain of a feeling of pressure in the epigastric region. The disturbance is not dependent on foods, so that dietetic treatment is ineffective. Nausea is frequent but vomiting is rare. If the duodenum is mobile beyond the duodenal papilla, biliary symptoms may predominate. There may be pain along the right costal arch with radiation toward the back and shoulder. The patients are usually of the asthenic type. General or partial ptosis may exist simultaneously. The clinical aspects generally do not suffice for a definite diagnosis and roentgenoscopy in different postures must be resorted to, although even this may lead to a mistaken diagnosis of ulcer or adhesion. Patients with mild symptoms require only medical treatment, but those with severe, relapsing disorders require surgical correction. Fixation to the posterior abdominal wall is one type of operation. Duval recommends posterior duodenopexy with simultaneous antropyloroduodenal attachment by means of a distally mobilized ligamentum teres hepatis. Duodenojejunostomy or gastroenterostomy may counteract stasis but will not correct the malformation. Since none of these methods have given complete satisfaction, Henschen suggested antroduodenal resection with retrocolic, posterior gastroenterostomy. The author employed this operation in the 5 cases.

Treatment of Habitual Shoulder Dislocation with Metal Barrier.—Ramser corrected habitual dislocation of the shoulder in a girl aged 18 by means of Brun's modification of Eden's method. A correctly measured piece of bone from the tibia had been inserted into a pocket on the anterior surface of the neck of the scapula, and immobilization of the arm had been maintained for seven weeks. Two years later the head of the humerus luxated forward repeatedly. A second operation revealed that the transplanted bone was completely absorbed. The author decided to employ nonabsorbable material. He used a clasp of rust free steel. The long peg, measuring 5 cm., was driven in extracapsularly at the edge of the glenoid cavity. It extended 1.5 cm. outward beyond the cavity; the shorter peg, measuring only 2.5 cm., was driven completely into the coracoid process. The middle piece, to which the two pegs stand vertically, measured 4 cm. and was slightly curved. The arm was immobilized for several days in an abduction splint and then gymnastic exercises were begun. Three weeks later the patient was able to assist in hay making. Suturing of the capsule to the short biceps tendon prevents slipping out of the metal clasp. Its deeper penetration is prevented by the coracoid process. In another patient a metal barrier was added to a bone implantation.

Archives de l'Institut Pasteur d'Algérie

21:53-130 (June) 1943. Partial Index

*Direct Transmission of Rickettsia Prowazeki to Lungs of Mice from Human Sternal Marrow. E. Benhamou, R. Horrenberger and G. Renoux.—p. 53.

Antimalarial Campaign in Department of Algiers in 1942. E. Collignon.—p. 55.

Report of Functions of Pasteur Institute of Algeria. E. Sergeant.—p. 89.

Transmission of Rickettsia Prowazeki to Lung of Mice from Human Sternal Marrow.—Benhamou and his collaborators state that the direct transmission of Rickettsia prowazeki from human sternal marrow to the lung of mice had its point of departure from the observation of one of the authors that Rickettsia prowazeki is encountered regularly in the sternal marrow of patients with exanthematic typhus in quantities sufficient to detect them by direct microscopic examination of slide specimens. From this time sternal marrow was used for the experimental transmission to receptive animals, particularly to those which serve for the production of typhus vaccine. The material which was used for inoculation was

obtained from patients with exanthematic typhus in whom the more or less characteristic picture was always confirmed by direct demonstration of Rickettsia prowazeki in the bone marrow slides. The sample obtained by sternal puncture was diluted in a small quantity of isotonic solution of sodium chloride and inoculated into 4 mice by the respiratory route and into 2 rabbits by the intracerebral and peritoneal routes. Subsequent passages from mouse to mouse were made by respiratory inoculation of ground pulmonary tissue and from rabbit to rabbit by intraperitoneal inoculation of ground brain tissue. In one out of five attempts it has been possible to isolate a strain of Rickettsia prowazeki and to adapt it to the lung of mice without passing it through an intermediate host such as rabbit or louse. This proves the high infective power of the bone marrow.

Archivos de Pediatría del Uruguay, Montevideo

14:403-466 (July) 1943. Partial Index

*Malignant Lymphogranulomatosis with Compression of Lymph Nodes Causing Serofibrinous Pleurisy and Jaundice in Children. H. J. Notti, H. V. Ferrer and A. Grinfeld.—p. 403.

Bone Changes in Leukemia in Children. J. A. Soto.—p. 415.

Malignant Lymphogranulomatosis in Children.—Notti and his associates report 4 typical cases of malignant lymphogranulomatosis in children between the ages of 3 and 8 years. Sternberg's cells were encountered in the blood of all 4 patients. Two of the patients presented, in addition to the enlargement of the cervical, axillary and mediastinal lymph nodes, enormously enlarged liver and spleen and anemia. Kahn, Pirquet and tuberculin tests were negative and the sputum did not contain tubercle bacilli. One of the patients developed a serofibrinous pleurisy as a result of compression by the mediastinal lymph nodes. Diffuse edema, dyspnea, cough and prostration were the predominant symptoms in the final stage of the disease. The other patient developed acute jaundice. Exploratory laparotomy in this case revealed compression of the hepatic and common bile ducts by enlarged lymph nodes. Roentgen, radium, arsenic and liver therapy failed to arrest the progress of the disease, in these cases which terminated fatally in about two years.

Arquivos de Cir. Clín. e Exper., São Paulo

7:69-104 (April) 1943. Partial Index

*Value of Lymph Node Puncture as Diagnostic Procedure. M. Pio da Silva.—p. 69.

Lymph Node Puncture.—Pio da Silva studied 29 cases of lymph node enlargement of various pathologic types. In all cases examination of the dry smear of material obtained by puncture was compared with the microscopic examination of the lymph node. May-Grünwald-Giemsa's method of staining was used in all smears. The lymph node puncture permitted the diagnosis of tuberculosis in 7 out of 12 cases either through the finding of tubercle bacilli or because of the presence of typical epithelioid and giant cells. In each of the 8 cases of blastomycosis smears revealed the presence of Blastomyces. In 4 cases of metastatic carcinoma the presence of numerous neoplastic cells in the punctate permitted a correct diagnosis to be made. In 2 cases of Hodgkin's disease the punctate revealed Reed-Sternberg cells and numerous eosinophils characteristic of the disease.

Gaceta Médica de Mexico, Mexico, D. F.

73:185-332 (June-Aug.) 1943. Partial Index

*Simple Atrophy of Optic Disk: A Sign of Subtentorial Tumor. M. Puig Solanes.—p. 199.

Atrophy of Optic Disk in Subtentorial Tumor.—Puig Solanes directs attention to the diagnostic value of simple atrophy of the optic disk in tumors of the fourth ventricle or of the cerebellum. Optic atrophy in these cases is the result of the acute dilatation of the ventricular system. Because ventriculography is contraindicated in certain cases of cerebral tumors, the diagnostic value of simple atrophy of the optic disk is obvious. Simple atrophy of the optic disk in patients with symptoms of intracranial hypertension and other signs of

involvement of cerebral structures in the posterior cranial fossa is pathognomonic of a tumor in these localizations. The diagnostic value of simple atrophy of the optic disk in the foregoing conditions is so reliable that it renders ventriculography unnecessary. The author reports 4 cases in which the diagnosis was verified by removal of the tumor from either the fourth ventricle or the cerebellum.

Prensa Médica Argentina, Buenos Aires

30:1525-1582 (Aug. 18) 1943. Partial Index

*Latent Liver Cirrhosis. R. Solé.—p. 1525.

Total Skin Free Graft. E. F. Malbec.—p. 1576.

Latent Liver Cirrhosis.—According to Solé, cirrhosis of the liver is a slowly developing process which in its early stage may produce no clinical symptoms or only atypical syndromes. Clinical and pathologic observations on the latent stage of liver cirrhosis are reported in 12 cases in which exploratory intervention was done because of gastrointestinal hemorrhages of undetermined etiology or because of a diagnosis of biliary stones or abdominal tumors. The only pathologic alteration found at the operation was a more or less severe cirrhosis of the liver diagnosed by biopsy. In all instances the exploratory laparotomy and the later course of the disease ruled out malignant neoplasm and biliary or gastric lesions. Histopathologically the liver proved to be the site of degenerative or inflammatory processes accompanied by connective tissue proliferation around and/or inside the hepatic lobules. Cirrhosis was associated with fatty degeneration of the hepatic cells, more or less extensive foci of necrosis, round cell infiltration, proliferation of vascular endothelium and Kupffer's cells, irregular regeneration of hepatic cells and of biliary canaliculi. Liver damage was always sufficiently extensive to account for a number of clinical syndromes including gastrointestinal hemorrhages; colicky pain with or without jaundice, usually diagnosed as biliary duct stones; anemia, loss of weight, anorexia and asthenia, sometimes with a rather rapid course resembling malignant tumor; and various types of dyspepsia. Cirrhosis of the liver should always be considered in similar instances when the etiologic factors are unknown.

Publicações Médicas, São Paulo

14:1-64 (May) 1943. Partial Index

Main Indications of Roentgenotherapy in Dermatology. J. P. Vieira.—p. 3.

*Sulfathiazole in Treatment of Dysentery and Acute Diarrhea in Children: Observations on 236 Cases. M. Altenfelder, P. P. Corrêa, Maria P. Moreira de Moraes, Alaide Mello Sá and L. Camargo Pentendo.—p. 15.

Sulfathiazole for Dysentery and Acute Diarrhea in Children.—Altenfelder and his associates employed sulfathiazole in the treatment of 236 children under 30 months of age with acute diarrhea, bacillary dysentery and amebic dysentery. The drug was administered in doses of 2 grains (0.13 Gm.) every six hours for a period of four days, regardless of the weight or the age of the patient. The drug was effective in all cases in which examination of the stool revealed *Escherichia coli*, *Salmonella*, *Shigella dysenteriae* and *Shigella paradysenteriae*. Complete recovery occurred within four days in this group. The drug had no beneficial effect on dysentery caused by *Lamblia intestinalis* and *Amoeba dysenteriae*. The tolerance to sulfathiazole was remarkable by all children except 1, who vomited and was unable to take the drug. No toxic symptoms were observed.

Revista Argentina de Neurol. y Psiquiat., Rosario

8:245-310 (March-June) 1943. Partial Index

*Acute Confusional State Associated with Waterhouse-Friderichsen's Syndrome. H. Hoff and J. A. Shaby.—p. 245.

Subacute Leukoencephalitis. T. Fracassi.—p. 261.

Acute Confusion Associated with Waterhouse-Friderichsen's Syndrome.—Hoff and Shaby report clinical and pathologic observations on 16 patients presenting acute mental confusion associated with features of acute severe infectious

disease with high temperature, shock, dehydration and loss of weight. In all cases there was a definite psychic disturbance and change of personality immediately preceding the onset of acute symptoms. The course of the disease was followed in 11 cases. The first 8 cases observed ended fatally in from five to twenty-one days. Postmortem examination revealed slight edema and congestion of the brain, distention of the thyroid follicles and extensive hemorrhages of the adrenal cortex. The clinical and pathologic features were considered by Hoff and Shaby as identical with those observed in the Waterhouse-Friderichsen syndrome associated with a condition of acute mental confusion. Accordingly, treatment with adrenal cortex extract, vitamin C and intravenous injections of metrazol was instituted in the last 4 cases observed. Recovery occurred in 3 of these 4 cases.

Revista de la Asoc. Méd. Argentina, Buenos Aires

57:523-580 (Aug. 15) 1943. Partial Index

Neurinoma of Anterior Cervical Region: Case. E. A. Votta.—p. 523.

*Genital Tuberculosis: Relation to Sterility. E. Twaites Lastra and A. Jakob.—p. 536.

Bilateral Tuberculosis of Breast. A. Egües and R. I. Latienda.—p. 554.

Genital Tuberculosis.—Thwaites Lastra and Jakob found tuberculosis of the endometrium in 14 of 1,098 women in whom curettage was performed. Tuberculosis of both fallopian tubes and of the endometrium was encountered in 12 of 840 women operated on for gynecologic disease. Tuberculosis of the internal genitalia lacks pathognomonic clinical signs. Seventy per cent of the patients complained of hemorrhages and of pain in the iliac fossae which increased during menstruation. None of the patients had clinical symptoms or x-ray signs of pulmonary tuberculosis. The authors believe that primary endometrial tuberculosis is more frequent than was formerly believed; it is the cause of sterility in about 7 per cent of the cases. Tubercle bacilli travel by way of the local lymphatic system from the intestine to the parametrium and parametrial and endometrial lymph nodes.

Revista Médica de Chile, Santiago

71:713-828 (Aug.) 1943. Partial Index

Goiter and Pregnancy. A. Covarrubias P.—p. 713.

Some Pharmacologic Actions of Urogastrone. E. Montero, F. Huidobro and A. Kuzmanic.—p. 717.

*Cirrhosis of the Liver and Medical Progress. A. Prat Echaurren and R. Jorquera.—p. 755.

Cirrhosis of the Liver.—Echaurren and Jorquera analyzed the data on 36 cases of cirrhosis of the liver followed for a period of one and a half years. According to the presence or absence of clinical signs of liver insufficiency, such as jaundice, hemorrhages, or ascites, the cases were classified in two groups: active and latent cirrhosis. In 80 per cent of 29 cases which were in an active, progressive stage, death occurred within twelve months of the onset of clinical symptoms. The presence or absence of hypertrophy or atrophy of the organ had no relation to the rate of progressiveness of the disease. The majority of the patients with active cirrhosis of the liver presented jaundice, high sedimentation rate, low prothrombin levels, low plasma protein levels, chloride retention especially in the globules, low chloride urinary excretion, oliguria, positive Takata-Ara reaction and low cholesteremia. Oliguria below 500 cc. daily and chloride urinary excretion lower than 2 Gm. per day were regularly associated with a very poor prognosis. In the group with latent liver cirrhosis the sedimentation rate was high as a rule, prothrombin levels were low in 60 per cent, and the Takata-Ara reaction was positive in all cases. Clinical symptoms in this group were scarce and atypical. Latent cirrhosis of the liver should always be considered in patients having pain in the hepatic region, biliary colic, gastrointestinal hemorrhages of undetermined origin, diarrhea, asthenia and history of alcohol addiction. All methods of treatment failed to prevent the progressive course of the active cirrhosis. In 7 out of 10 cases the daily administration of 600 mg. of inositol, combined with a high protein diet, was associated with gain in weight, disappearance of gastrointestinal

symptoms, increase in diuresis and a definite subjective improvement. Echaurren and Jorquera point out that this method of treatment deserves further investigation, particularly in the early stages of cirrhosis of the liver.

Semana Médica, Buenos Aires

50:583-646 (Sept. 9) 1943. Partial Index

*Monocytic Angina, Also Called Infectious Mononucleosis. J. Matusevich.—p. 599.

Asthma and Insufficiency of Liver. G. A. Barros.—p. 610.

Monocytic Angina.—This is a frequent infection. The disease appears in epidemic outbreaks. It is more frequent in children and young persons. The diagnosis is made from clinical symptoms from repeated examinations of the blood and from the serologic test. The clinical symptoms are those of any general infection with or without acute tonsillitis, cervical and submaxillary adenitis and fever. Acute tonsillitis is present in the majority of the cases. It is generally unilateral. Local fusospirillar symbiosis is almost constant, but Löffler's bacteria are not found. There may be enlargement of the lymph nodes of the axilla and of the groin and splenomegaly. Adenitis and the acute fever which appear early in the course of the disease may disappear rapidly or persist for weeks or months. Fever declines by lysis and frequently recurs for several short periods. The erythrocytes are normal. The study of white cells is indispensable for a diagnosis. There is a leukocytosis between 10,000 and 40,000 and a high mononucleosis with predominance of monocytes and lymphocytes. A positive Davidsohn serologic test is specific for the disease. Administration of calcium and liver preparations and of vitamins shortens the course of the disease and renders the symptoms milder.

Archiv für Kinderheilkunde, Stuttgart

126:1-64 (May 29) 1942

Intussusceptum Evacuated in Natural Way. F. Szlávik.—p. 2.

Endemic Appearance of Hepatic Cirrhosis in Early Childhood. F. Schuler.—p. 5.

Problem of Immunization in Scarlet Fever. Z. Teveli.—p. 30.

*Atypical Forms of Poliomyelitis. E. Strangmann.—p. 38.

Acute Atrophy of Liver During Childhood. E. Gasser.—p. 49.

Atypical Forms of Poliomyelitis.—Strangmann shows that in addition to the classic spinal form of poliomyelitis there exist nonparalytic, meningitic, cerebral and cerebellar types. He describes atypical cases of poliomyelitis observed by him during the summer and fall of 1941. The nonparalytic meningitic forms were particularly numerous. There were also cerebral forms and encephalitis-like disturbances with rapidly changing mental symptoms. These types are of particular significance for the early diagnosis of poliomyelitis. During epidemics it is essential to pay attention to all the known prodromal symptoms and to perform spinal punctures whenever meningitic symptoms are present. While nonparalytic cases of poliomyelitis furnish valuable convalescent serum, the fact that some of these cases are incorrectly diagnosed reduces the value of such serum.

Deutsche medizinische Wochenschrift, Leipzig

68:649-672 (June 26) 1942. Partial Index

*Carcinoma of Stomach and Gastritis: Evaluation of So-Called Anamnesis of Carcinoma. H. Westhues.—p. 649.

Clinical Value of Demonstration of Tubercle Bacilli in Feces of Patients with Tuberculosis of Lungs. J. E. Wolf.—p. 653.

Congenital Anomalies of Brain. A. Czerny.—p. 658.

Whole Grain Flour in Formula of Babies and in Diet of Infants. H. Gronau.—p. 660.

Objections Against Diet Opposed to Carcinoma. M. Weiser.—p. 663.

Carcinoma of Stomach and Gastritis.—Westhues considers three types of clinical courses of gastric carcinoma. The first type is represented by cases with a long, severe course caused by a chronic, severe gastritis. Chronic gastritis is different from atrophic gastritis. Carcinoma may have developed from gastritis in some of the cases, but causal relationship between carcinoma and severe chronic gastritis may be absent in other cases, while the gastritis may be secondary, caused by primary blastomatous polypi in still other cases. This group

is small. A long history usually divided into two phases will be found in the second group. The first phase may sometimes be traced for many years. This, so-called "preanamnesis," is characterized by mild clinical disturbances ("weak stomach"). Thus a mild type of chronic gastritis may be the pathologic-anatomic basis from which, however, carcinoma will not develop, or there may be gastritis of old age or even a gastrosis, which does not depend on inflammation. It may be a predisposing "specific" condition of mucous membrane from which carcinoma may result. In the first instance the preanamnesis is not related to the later occurrence of carcinoma; in the second type one deals with a true preanamnesis of carcinoma as related to gastritis of old age or to gastrosis. The preceding history therefore is not of practical importance when one considers the frequency of mild common gastritis. The second and short phase refers to the true severe carcinoma—gastritis associated with a more or less acute onset during the last few months. It is an acute gastritis caused by a carcinoma developing on a basis of an existent chronic gastritis-gastrosis. The true carcinoma-gastritis thus always presents a chronic atrophic gastritis associated with an acute onset. This gastritis is associated with acute exacerbation and cannot be the cause of the carcinoma. The long mild anamnesis with two phases does not support the concept that inflammation is of essential importance in the genesis of carcinoma. The classic short anamnesis is found in the third group. From the pathologic-anatomic point of view one deals with the same chronic atrophic gastritis on which the principal history of the previous group has been based, but clinical symptoms have not resulted from the gastritis of old age. The severe gastritis to which the short anamnesis refers is secondary and is thus not responsible for the carcinoma. The time factor in these cases is also opposed to the inflammatory genesis of carcinoma. Gastritis may play, however, a certain incentive role although carcinoma is not of inflammatory origin in the majority of the cases. The treatment of gastritis (particularly resection for gastritis) may play some part in the prophylaxis of carcinoma. But incidence of carcinoma will not be decisively reduced by this type of treatment. Early treatment of carcinoma based on early diagnosis is the main prophylaxis of carcinoma. The long history calls for a particularly careful clinical examination and continued control of the individual case.

Medizinische Klinik, Berlin

38:529-552 (June 5) 1942. Partial Index

Sensitizing and Protective Substances Against Action of Light Rays on Skin. G. Hopf.—p. 529.

*Lambliasis Intestinalis in Poland. E. F. Rissmann.—p. 532.

Roentgenologic Examinations of Kidneys. L. Stelir.—p. 534.

Bactericidal Action of Synthobilin, a Choleretic Substance. B. Kemkes.—p. 540.

Lambliasis Intestinalis.—At Rissmann's hospital in Krakow it was the rule to perform duodenal aspiration on all patients with gastrointestinal disturbances and it was found that lambliasis was about as frequent as bacillary dysentery. Twenty-six cases of lambliasis were observed during the same period in which 25 cases of bacillary dysentery occurred. The largest number of cases occurred when lettuce and radishes appeared on the market in larger quantities, that is during the months from June to October. Rissmann rejects the idea that *Lambia intestinalis* is a harmless parasite. An alkaline milieu greatly favors its development. The lamblias flourishes in the duodenum particularly when gastric aspiration reveals anacid or subacid values. Eight of the author's patients had no free hydrochloric acid, 12 had subacid values, 5 had normal acidity and only 1 had hyperacidity. There are 3 types of lambliasis: the gastrointestinal, the cholangitic-hepatic and the cachectic form. One type develops chronologically from another if the disease is not detected and treated during the early stages. Acridine dye derivatives such as atabrine and acranil are most effective in the treatment. The therapeutic success should be controlled by duodenal aspiration. All hygienic measures against intestinal infections are directed also against lambliasis. Duodenal aspiration should be done in every persistent epigas-

involvement of cerebral structures in the posterior cranial fossa is pathognomonic of a tumor in these localizations. The diagnostic value of simple atrophy of the optic disk in the foregoing conditions is so reliable that it renders ventriculography unnecessary. The author reports 4 cases in which the diagnosis was verified by removal of the tumor from either the fourth ventricle or the cerebellum.

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Subacute Leukoencephalitis. T. Fracassi.—p. 261.

Acute Confusion Associated with Waterhouse-Friderichsen's Syndrome.—Hoff and Shaby report clinical and pathologic observations on 16 patients presenting acute mental confusion associated with features of acute severe infectious

disease with high temperature, shock, dehydration and loss of weight. In all cases there was a definite psychic disturbance and change of personality immediately preceding the onset of acute symptoms. The course of the disease was followed in 11 cases. The first 8 cases observed ended fatally in from five to twenty-one days. Postmortem examination revealed slight edema and congestion of the brain, distention of the thyroid follicles and extensive hemorrhages of the adrenal cortex. The clinical and pathologic features were considered by Hoff and Shaby as identical with those observed in the Waterhouse-Friderichsen syndrome associated with a condition of acute mental confusion. Accordingly, treatment with adrenal cortex extract, vitamin C and intravenous injections of metrazol was instituted in the last 4 cases observed. Recovery occurred in 3 of these 4 cases.

Revista de la Asoc. Méd. Argentina, Buenos Aires

57:523-580 (Aug. 15) 1943. Partial Index

Neurinoma of Anterior Cervical Region: Case. E. A. Votta.—p. 523.

*Genital Tuberculosis: Relation to Sterility. E. Twaites Lastra and A. Jakob.—p. 536.

Bilateral Tuberculosis of Breast. A. Egües and R. I. Latienda.—p. 554.

Genital Tuberculosis.—Thwaites Lastra and Jakob found tuberculosis of the endometrium in 14 of 1,098 women in whom curettage was performed. Tuberculosis of both fallopian tubes and of the endometrium was encountered in 12 of 840 women operated on for gynecologic disease. Tuberculosis of the internal genitalia lacks pathognomonic clinical signs. Seventy per cent of the patients complained of hemorrhages and of pain in the iliac fossae which increased during menstruation. None of the patients had clinical symptoms or x-ray signs of pulmonary tuberculosis. The authors believe that primary endometrial tuberculosis is more frequent than was formerly believed; it is the cause of sterility in about 7 per cent of the cases. Tubercle bacilli travel by way of the local lymphatic system from the intestine to the parametrium and parametrial and endometrial lymph nodes.

Revista Médica de Chile, Santiago

71:713-828 (Aug.) 1943. Partial Index

Goiter and Pregnancy. A. Covarrubias P.—p. 713.

Some Pharmacologic Actions of Urogastone. E. Montero, F. Huidobro and A. Kurmanic.—p. 717.

*Cirrhosis of the Liver and Medical Progress. A. Prat Echaurren and R. Jorquera.—p. 755.

Cirrhosis of the Liver.—Echaurren and Jorquera analyzed the data on 36 cases of cirrhosis of the liver followed for a period of one and a half years. According to the presence or absence of clinical signs of liver insufficiency, such as jaundice, hemorrhages, or ascites, the cases were classified in two groups: active and latent cirrhosis. In 80 per cent of 29 cases which were in an active, progressive stage, death occurred within twelve months of the onset of clinical symptoms. The presence or absence of hypertrophy or atrophy of the organ had no relation to the rate of progressiveness of the disease. The majority of the patients with active cirrhosis of the liver presented jaundice, high sedimentation rate, low prothrombin levels, low plasma protein levels, chloride retention especially in the globules, low chloride urinary excretion, oliguria, positive Takata-Ara reaction and low cholesteremia. Oliguria below 500 cc. daily and chloride urinary excretion lower than 2 Gm. per day were regularly associated with a very poor prognosis. In the group with latent liver cirrhosis the sedimentation rate was high as a rule, prothrombin levels were low in 60 per cent, and the Takata-Ara reaction was positive in all cases. Clinical symptoms in this group were scarce and atypical. Latent cirrhosis of the liver should always be considered in patients having pain in the hepatic region, biliary colic, gastrointestinal hemorrhages of undetermined origin, diarrhea, asthenia and history of alcohol addiction. All methods of treatment failed to prevent the progressive course of the active cirrhosis. In 7 out of 10 cases the daily administration of 600 mg. of inositol, combined with a high protein diet, was associated with gain in weight, disappearance of gastrointestinal

Book Notices

History of Surgery. By Richard A. Leonardo, M.D., Ch.M., F.I.C.S. Cloth. Price, \$7.50. Pp. 501, with 100 plates. New York: Froben Press, 1943

The appearance of the first history of surgery in English will be welcomed by members of the medical profession. The volume contains 370 pages of text, 56 pages of bibliography, 23 pages of index and 100 plates of illustrations grouped together as a sort of appendix to the text. To condense the subject matter at hand into 376 pages calls for skill in condensation, selection and balance rarely possessed by the casual writer. In appraising this difficult task the reviewer is quite conscious of the difficulties which confronted the author. The chapters dealing with the practices of the ancient peoples contain much that is interesting and instructive. The subsequent chapters show some of the disadvantages of trying to tell much in short space. There appear some avoidable errors, minor inaccuracies, errors in overemphasis as well as in understatement and errors of omission and of judgment. Most of these are not of great importance and do not impair the value of the work. Attention is called to them merely because the reviewer feels that the function of "a history" is to eliminate errors rather than to perpetuate them.

Military surgery is dealt with in three pages and does not contain the names of Larrey, Pirogov or von Bergmann. In the chapter on thoracic surgery the subject of pulmonary embolectomy is dismissed by stating that Kirschner performed the first successful pulmonary embolectomy in 1924. The fact that Trendelenburg in 1908 conceived the operation and developed its technic on cadavers is not mentioned, nor is it stated that following a number of unsuccessful attempts after the Kirschner operation A. W. Meyer performed several successful pulmonary embolectomies (*Surg., Gynec. & Obst.* 50:891 [May] 1930). To dismiss the subject of ethylene anesthesia with a single line (p. 339), "Ethylene anesthesia in genitourinary surgery was used by Kretschmer (1911)," does not make sense. It does injustice to the physiologist Arno Luckhardt, who discovered the anesthetic properties of the gas, and credits Kretschmer with something to which he never laid claim. Kraske was born, educated, trained and worked all his life in Germany. To place him in Switzerland is an error that could have been avoided by consulting the reliable Fischer. Speaking of Bassini, the author states "Well known also is Bassini's operation for inguinal hernia—an operation done in hundreds of cases daily." Bassini is remembered today only because of his classic herniotomy; whatever other contributions he has made are of no historical importance. This is an example of an error in emphasis.

Finsterer is accorded more than a page, while von Eiselsberg receives five lines. Von Eiselsberg was, of course, a greater surgeon and did far more to advance surgery than Finsterer. The author appears to be much impressed by the number of gastrectomies performed by Finsterer. If that is his criterion, then the palm should go to von Haberer, who, by the way, is mentioned only in passing. As a matter of fact, Finsterer's claim to either originality or priority in the operation for subtotal gastrectomy with an end to side anastomosis is not well founded. This operation was first conceived by von Hacker in 1885 and was first performed by Krönlein. It was elaborated by von Eiselsberg, Roux, von Mikulicz, Delagènière, Doyen and others. In its present form, to which it was brought by Hofmeister, it has been given further application by a great number of surgeons, such as Reichel, Sasse, Polya, the Mayos and Moynihan. The report of 56 cases in which Hofmeister operated can be found in a contribution by W. Burk, one of his assistants (*Beitr. z. klin. Chir.* 76:638, 1911). Finsterer in 1913 advocated a very radical resection of the stomach for the cure of ulcer on the ground that the acidity is reduced thereby, an idea to which we today do not wholeheartedly subscribe. However, the method described by him does not differ in any detail from that of Reichel or of Hofmeister (see "Gastric Resection and Various Methods of Reestablishing the Continuity of the Gastrointestinal Tract," *International Abstract*

of Surgery, Collective Review, February 1926). It would be only fair to call attention to the fact that Emil Rees of Chicago developed independently of and prior to Wertheim the same operation for carcinoma of the cervix uteri with which Wertheim is correctly credited.

In the chapter on American surgery the author includes men whose sole claim to immortality appears to be membership in certain associations or being a secretary or an editor of a surgical publication. It is not argued that these men are not competent surgeons. Competence alone, however, and mastery of ideas and technics developed by others do not entitle one to be mentioned among the makers of surgical history. Only men who have advanced the frontiers of our knowledge in this field are entitled to that unique honor. This is error in judgment as well as bad taste. One begins to wonder whether the author is writing a history or compiling a directory. The name of L. L. McArthur should have been mentioned among the pioneers in the field of appendicitis. Halstead introduced rubber gloves in his operating room not primarily to improve asepsis but because his head surgical nurse could not tolerate powerful antiseptics on her hands. While it is true that Nicholas Senn bequeathed his collection of books to the Newberry Library (p. 315) it is worth noting that the Newberry Library turned the gift over to the John Crerar Library, where the gift is lodged in the Nicholas Senn Room. The service this library is rendering the profession deserves mention.

Finally, it is felt that the illustrations would serve their purpose much better if they accompanied the text rather than being grouped together at the end of the book as a sort of separate chapter.

Family Nutrition. Published by the Philadelphia Child Health Society. Second edition. Paper. Price, 50 cents. Pp. 119, with illustrations. Philadelphia, 1943.

This monograph on family nutrition is a complete treatise. Much of the material is closely set in long lines of relatively small type, which does not make for easy reading. For the student of nutrition, the teacher or the demonstrator, this manual should be exceptionally valuable. It is on too high a scientific level for the vast majority of housewives. Yet it contains much material of great value to precisely this group. The chapter on the dietary value of common foods, and especially the illustrative pages facing the text, is not only informative but is the most readable part of the entire booklet. An excellent feature is the full page bleed-off illustrations and many of the diagrams. Another valuable feature is that beginning on page 70, which shows a week of good meals for children, for boys and girls, for adolescents, for expectant mothers and for various family income groups. As a reference manual for persons capable of using such a device, this publication could be of extreme usefulness in the upper third of homes, where, unfortunately, it is needed least. In fact, to the vast group of nonprofessional persons who make up what is vaguely referred to as "the public" this excellent production would unfortunately remain unappreciated.

The Education of Nurses: Historical Foundations and Modern Trends. By Isabel Maitland Stewart, R.N., A.M., Professor of Nursing Education and Director of the Division of Nursing Education, Teachers College, Columbia University, New York. Cloth. Price, \$3.50. Pp. 399. New York: Macmillan Company, 1943.

Primarily designed for students and educators in nursing, this book presents the progress of nursing education from its ancient origins to the problems it faces in the postwar world. Parallels to the progress and problems of medical education are close: informal instruction preceded the organization of schools, which flourished in numbers if not in quality. There was concern over a supply of graduates, many of them poorly trained, in excess of demands for their services, followed by a decrease in numbers through enforcement of elevated educational standards and improved instruction. The war and its unpredicted casualties then created a shortage, requiring a wisely adjusted balance between unwarranted increases in graduates to serve the new demands and a preservation of such educational standards as would insure adequate care of the sick and injured in wartime and after the peace. The book is written with an imagination that refutes the events of the dead past to the living problems of today and tomorrow.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

MENTAL IMPAIRMENT IN EPILEPSY

To the Editor:—Most of the textbooks teach that epilepsy has much effect on the mind or mental faculties. I seem to recall that some good authority said that the present teaching was that epilepsy seldom affected the mind. Are you able to give me any information on this subject, especially as it affects childhood epilepsy?

Ludwig L. Sogge, M.D., Windom, Minn.

ANSWER.—Approximately one third of epileptic patients seen outside of institutions show some degree of mental impairment, though in only about 10 per cent is this so gross as to be immediately evident. Mental deterioration, when it occurs, is not necessarily the result of the epilepsy. It may be genetic or the result of an antecedent brain injury, of oversedation or of social and intellectual isolation. Various factors may be at work in a given person. The younger the patient when epilepsy begins the graver the prognosis. However, as with adults, various conditions greatly modify the individual outlook. The prognosis is improved if the child had a negative family history of epilepsy or mental disorder, was mentally normal at birth, has no evidence of brain disease, has petit mal (pyknolepsy) or infrequent grand mal and receives proper drug and psychologic treatment. Bibliographies and statistical data on this subject may be found in the following books:

Penfield, Wilder, and Erickson, T. C.: *Epilepsy and Cerebral Localization*, Springfield, Ill., Charles C Thomas, 1942.

Lennox, W. G.: *Science and Seizures*, New York, Harper & Brothers, 1941.

METHYL TESTOSTERONE FOR MYASTHENIA GRAVIS

To the Editor:—Do you have any information on the use of testosterone preparations in the treatment of myasthenia gravis? I have been told that methyl testosterone has been used in this disease because of its effect on creatine and creatinine metabolism.

M.D., Illinois.

ANSWER.—Methyl testosterone has been used in the treatment of myasthenia gravis. Reports on this therapy have not appeared in the literature so far as is known. One clinic has used the drug in the following manner: Fifty mg. has been given each day for a period of two weeks. If no response occurred at that time in the symptoms of myasthenia gravis, the drug was discontinued. At the end of two weeks, if response had taken place, the amount was reduced to 30 mg. a day for a period of four weeks. This was followed by a period of two weeks with a dose of 20 mg. a day. The drug was always taken by mouth. The dosage schedule, as indicated, was set up in an entirely arbitrary manner, there being no way to estimate the amount needed in myasthenia gravis.

One patient, a physician, made a careful observation of his own reactions to this drug. He was well adjusted to prostigmine bromide and therefore was in a position to judge the effect of the addition of methyl testosterone. He was careful, moreover, to control adequately the period of observation, making no change in his way of life. He reports that, after the first forty-eight hours of taking the drug, slow, steady improvement began, which was continued during the subsequent six months. The first effect of the methyl testosterone was a violent peristalsis, indicating that the patient was receiving an overdose of prostigmine bromide. The patient was able to reduce the prostigmine dosage from ten to twelve 15 mg. tablets a day, his maintenance schedule, to about five tablets a day. At the same time he experienced a sense of well-being. When the methyl testosterone was discontinued after a month's trial, he had the most severe exacerbation of his symptoms of myasthenia gravis that he had ever experienced. When methyl testosterone was again given at the end of six weeks, another remission in the myasthenia gravis occurred. In this single case, therefore, the report would indicate that methyl testosterone, when given to patients with myasthenia gravis, tends to cause a remission which lasts as long as the methyl testosterone is taken. One should not conclude, however, that the experiences of this trained observer necessarily mean that similar results would be experienced in other cases. In 4 other cases, moreover, when the drug was used, 1 responded in a similar manner, but in 3 others good effects were not observed.

OVULATION AND PREGNANCY

To the Editor:—When a woman becomes pregnant, does ovulation cease for the duration of the pregnancy? I am teaching a class of nurses and was asked this question. My answer was that I thought ovulation ceased, but I was not positive. I had trouble finding a satisfactory answer in books so am writing you. Further, is it through endocrine action that it ceases, if it does?

M.D., Wisconsin.

ANSWER.—Ovulation probably ceases in women during pregnancy. The main evidence is that: 1. Ovaries removed at operation from pregnant women show no recent corpora lutea nor other evidence that ovulation takes place. It is believed that maturation of the ovum may occur but that this terminates in degenerative changes and atresia. 2. If ovulation did occur in human pregnancy one would think that the ovum so produced would not infrequently become fertilized during the first three months of gestation, when the uterine cavity has not yet become obliterated by the fusion of the decidua vera and decidua reflexa. Under such circumstances it would seem quite possible for the ovum to descend the fallopian tube and embed itself in the decidua vera, thereby giving rise to a second, younger pregnancy, or superfetation. Actually, proved cases of superfetation in the human being are not on record (Studdiford, W. E.: *Am. J. Obst. & Gynec.* 31:845 [May] 1936). 3. In the rabbit a definite physiologic inhibition of ovulation exists during pregnancy. Thus, Snyder and Wislocki (*Bull. Johns Hopkins Hosp.* 49:106 [Aug.] 1931) have found that in the pregnant rabbit the amount of pregnancy urine required to produce ovulation is twenty to forty times that needed in the nonpregnant animal.

This presumable cessation of ovulation during pregnancy is almost certainly endocrine in nature. Two explanations have been advanced: the inhibitory effect of progesterone on ovulation and the action of chorionic gonadotropin, probably through the pituitary, in suppressing ovarian function.

MASKING AND CONTAGION

To the Editor:—"The value of wearing masks in contagion, . . . particularly with reference to epidemic meningitis, tuberculosis, diphtheria and virus pneumonia" (*The Journal*, Oct. 16, 1943, p. 448), merits comment.

Operating room technic demands masking of the nose and mouth because this has proved to reduce sharply the infection of the wound, blocking most of the point blank showering of fresh droplet borne pathogens of healthy carriers from access to relatively unresisting tissues of patients. Contagious precaution technic for diphtheria and virus pneumonia similarly demands masking of all personnel and visitors. It applies also to scarlet fever, measles, influenza, infectious mononucleosis and all such diseases as notably lower resistance, since superinfections complicating them often arise not from the patient's own microflora but from contact carriers' new invasive pathogens. Groups of rheumatic fever convalescents deserve such precautions, and infants should always be so shielded from the common colds of the household. Indeed, the operating room is but one of the places where susceptible exposed tissues are efficiently safeguarded by masking.

Bactericidal aerosol sprays and ultraviolet barriers can be nullified momentarily by the vagaries of air currents, so that they are not to be depended on to protect against the transfer of fresh pathogens as described, or even against all the air contaminants persisting after dispersal and settling or drying of vector droplets. Fine on paper, in practice they stand with sulfonamide prophylaxis in requiring constant toxicologic and bacteriologic checking. They in no way replace the need of masking, which acts right at the source to prevent significant massive inoculums from ever reaching the air, i. e. by air asepsis.

Of course it is never the mask wearer who is being protected. All agree that dried aerial microflora is poorly filtered by any tolerable mask yet devised. Protection for the wearer would have to resemble a gas mask to prevent heavy seeding of the nose and throat of air bacteria transported in tears through the nasolacrimal ducts. Unthinking writers have repeatedly misinterpreted these facts to condemn all masking: they do not realize at all what the proper role of the mask is.

Dangerous respiratory contagions always demand masking during physical examinations and during bedside care, for sick people even when themselves physicians rarely remain so well mannered as not to cough or speak into others' faces. Here the patient must temporarily don the mask, since it works only against the egress of pathogens. Patients having open tuberculosis are unfortunately seldom masked even in teaching institutions. Since most entering students of medicine and nursing are nowadays tuberculin negative and ought to be kept so, such masking as the first step must be enforced to improve the record of occupational tuberculosis morbidity.

Tuberculous patients also benefit by instruction. While they do not learn from usual precepts and pamphlets to lessen gross contamination of air and objects in their surroundings, they do learn readily after they have seen for themselves the insidious spreadings of their own sputum. It is for the physician to dust onto the pharynx a few milligrams of powdered medicinal methylene blue with a clean dried camel's hair brush. A few such applications suffice to teach even an obtuse patient the habits that efficiently keep sputum from reaching most of his close environs (by way of toothbrush, fingers and so on) and that lessen significantly the contamination of air by close range speaking and by open mouthed and unmuffled sneezing or coughing.

Let no one suppose that buying bactericidal gadgets solves the problem, and particularly let no one condemn the aseptic role of masks.

Robert J. Kinney, M.D., Boston.

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FALCIPARUM MALARIA

THE IMPORTANCE OF EARLY DIAGNOSIS AND
ADEQUATE TREATMENT

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AND
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Prior to and since the entry of the United States into the present war, a large number of American civilians have been employed in construction and other occupations in tropical areas where falciparum malaria is endemic or hyperendemic. Already a number of these persons have returned to this country. Some give a history of having had recognized malaria abroad, some have apparently had it in an unrecognized form, and others have become infected en route to America and have come down with acute attacks shortly after their arrival.

Unless one is familiar with the extremely varied clinical picture which falciparum infection may assume and the possibility of the development of alarming symptoms requiring early and intensive therapy, the infection may remain unrecognized and may even terminate fatally. In fact, this tragic circumstance has already occurred among the group dealt with in this report. A striking example of the confusion, difficulties and fatalities which may occur in an area where this disease is not common was seen when physicians in New York City and elsewhere were confronted with the problem of falciparum malaria in drug addicts.¹

Our object in the present report is to review the clinical aspects of falciparum malaria and to emphasize the necessity of keeping this disease in mind when seeing patients with a history of travel or residence in the tropics. Illustrative cases presenting some of the problems in diagnosis are briefly presented, and effective treatment of falciparum infections is outlined.

GENERAL CONSIDERATIONS

The biologic characteristics of *Plasmodium falciparum* are sufficiently different from the other human malarial parasites to be reflected in the peculiar, often bizarre, clinical features and pathology of falciparum malaria. The fundamental differences have been summarized by Kitchen² as follows:

(a) "Internal sporulation." Unlike *Plasmodium vivax* and *Plasmodium malariae*, which undergo development and schizogony in the circulating blood, *Plas-*

modium falciparum completes the latter part of its asexual cycle in the capillaries. The rings grow in the circulating blood for a period of from twelve to twenty-four hours and then disappear into the capillaries, where the parasitized red cells adhere to the endothelial lining of the smaller vessels. Infected red cells also adhere to one another. This frequently results in complete obstruction to numerous capillaries. Predominant localization of such a process in an organ requiring continuous circulation, such as the brain, intestine and heart, readily explains the pathology and clinical disease which one sees in falciparum malaria.

(b) "Marked invasiveness." The potentialities of the parasite density in falciparum infection are limited only by the number of red blood cells. The rapid increase in the number of parasites frequently results in counts as high as two million parasites per cubic millimeter, particularly in fatal cases. This adds to the malignant or pernicious nature of this infection.

(c) "Asynchronicity." The unpredictable and frequently irregular temperature curve which is seen in falciparum infections is probably due to the fact that this parasite is less uniform than the other two human species in the time of completion of its asexual cycle.

CLINICAL ASPECTS

Numerous attempts have been made to classify the various clinical manifestations of falciparum malaria on the basis of the predominant organ or system involved. Such a classification may be useful but can be misleading if one fails to recognize the possibility that the infection may involve several systems with equal severity at the same time.

Predominant Cerebral Involvement.—Stupor and coma are the commonest evidence of nervous system involvement. Convulsions may occur and in some cases have been erroneously ascribed to alcoholic poisoning or head injury. Other neurologic signs, although present in some fatal cases, are not of particular diagnostic aid. Stiffness of the neck, hyperreflexia and pathologic pyramidal tract reflex signs are the most common of these findings. Occasionally intermittent rigidity or sucking and grasping reflexes are seen. Rectal and vesical incontinence are quite common. On the whole, the signs are suggestive of an acute meningitis or encephalitic process.

Mental symptoms are occasionally the outstanding feature of onset and may result in the admission of the patient to a psychiatric institution. The usual finding is confusion, which may be accompanied by restlessness or negativism. Mental symptoms demand immediate intensive parenteral treatment. Such patients must be watched very closely, since they may become manic or commit suicide.

CASE 1.—L. A., a man aged 52, a welder, returned from East Africa to the United States by airplane on Aug. 29, 1943. En route he stopped for a week at Accra, Gold Coast. On arriving in Miami he experienced a chill but continued

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1. Most, Harry: Falciparum Malaria Among Drug Addicts. *Epidemiologic Studies*, Am. J. Pub. Health 30:403 (April) 1940; Falciparum Malaria in Drug Addicts. *Clinical Aspects*, Am. J. Trop. Med. 20:551 (July) 1940; Malignant Malaria Among Drug Addicts. *Epidemiological, Clinical and Laboratory Studies*, Tr. Roy. Soc. Trop. Med. & Hyg. 34:139 (Aug.) 1940.

2. Kitchen, S. F.: The Infection in the Intermediate Host. *Symptomatology, Falciparum Malaria, in a Symposium on Human Malaria*, Publication 15. American Association for Advancement of Science, 1941.

his trip to New York. Two days after his arrival at home he consulted a physician because of upper respiratory symptoms. Coryza was the only physical finding. The temperature was normal, and symptomatic treatment was prescribed. The following day he had a severe chill and could not recognize his wife. He was admitted to the hospital in a deep stupor and could not be aroused even by painful stimuli. His neck was slightly rigid and there was bilateral ankle clonus. There was rectal and urinary incontinence. The temperature was 104 F. Examination of a thin blood film revealed 2,100,000 falciparum parasites per cubic millimeter. Numerous schizonts were found, and many of the monocytes and polymorphonuclear neutrophils contained malarial pigment. The patient received several small doses of quinine sulfate by stomach tube; also a saline infusion and a transfusion. When he was seen in consultation twenty four hours later the blood pressure was 60/40. Intensive quinine treatment by vein was instituted. Infusions and transfusions were continued, but the patient failed to respond and died on September 5, eight days after his first chill. At autopsy all the capillaries of the brain were practically occluded by parasitized red cells.

The presenting symptom when the patient was first seen by a physician was coryza. If a blood smear had been examined at this time, it is probable that the diagnosis would have been established and that intensive treatment by mouth would have prevented the subsequent development of cerebral symptoms. Furthermore, intravenous treatment with large doses of quinine dihydrochloride as soon as the diagnosis was made might have prevented a fatal outcome.

CASE 2.—J. R., a man aged 22, a welder, had been employed in Africa. He arrived in the United States on Feb. 4, 1943 by plane, having stopped at Accra for several days. He had a routine clinical examination in New York on February 8, at which time he had no complaints and there were no objective abnormal findings. His blood was not examined.

The patient first became ill on February 15 in Chicago, with chills, generalized aching, nausea, vomiting, headache and profuse perspiration. A physician found nothing noteworthy on examination except a temperature of 100 F. The provisional diagnosis was grip, and the patient received symptomatic treatment. He apparently improved during the next two days but became suddenly worse on February 18. On admission to a hospital that day he was restless and had a temperature of 104 F. There were no definite physical signs. The white count was 3,500 per cubic millimeter. No parasites were discovered in the thin film. The next day the temperature was normal, but severe headache and nausea continued. A consultant arrived at no definite diagnosis but suggested that typhoid, tuberculosis, leishmaniasis, Chagas' disease, malaria and pneumonia be considered. The next day a thin blood film revealed an overwhelming infection with *P. falciparum*. The patient was delirious and tried to get out of bed. The temperature rose to 104 F., and coma ensued. Two doses of quinine hydrochloride were given intravenously at an interval of eight hours. In addition oxygen was administered and fluids were given by vein. The temperature rose to 107 F. The patient had repeated convulsions and died on February 21, six days after the onset of his illness, three days after admission to the hospital and two days after the diagnosis was established. Specific treatment had been administered only on the day of death.

We have here an example of a person perfectly well on one day and dead six days later of cerebral malaria. At the onset the disease masqueraded as a simple upper respiratory infection. If at this time malaria had been borne in mind, repeated blood examinations by means of thick and thin films would have established the diagnosis and intensive treatment could have been begun early enough to prevent a fatal outcome.

CASE 3.—J. U., a man aged 25, an aeronautic engineer, returned to the United States by plane from India on Oct. 2, 1942. He first became ill on October 10, when he complained of chills and coryza. He perspired profusely and called his physician, who found nothing striking in the examination and considered the complaints related to an upper respiratory infection, for which he prescribed symptomatic treatment. During the next few days the patient complained of severe headache and vomiting. He then suggested to his physician the possibility of malaria as the cause of his illness. Blood smears were positive and the patient was admitted to the hospital. During the next twelve hours he received only 5 grains (0.32 Gm.) of quinine sulfate in sugar coated pills after each meal. When seen in consultation the same day, the patient was delirious. There was slight jaundice, the reflexes were hyperactive and urination was difficult. The temperature was 104 F. Thin blood films revealed *P. falciparum*, approximately 210,000 per cubic millimeter. Gametocytes were moderately abundant and many monocytes contained malarial pigment.

The acute nature of the infection in the face of severe vomiting and pronounced parasitemia with probable cerebral localization indicated the necessity of intravenous treatment. Quinine dihydrochloride was given in doses of 0.6 Gm. every six hours for four doses accompanied by intravenous fluids. Thereafter quinine was given by mouth in doses of 0.6 Gm. every six hours for one week. The patient recovered promptly.

The presenting symptoms were those of an upper respiratory infection. Malaria was not considered until the patient suggested it. The diagnosis was readily established by blood examination. Clinically the patient seemed on the way to developing cerebral manifestations. Treatment when begun was not intensive enough in the face of the high parasitemia. Sugar coated pills are not advisable in the treatment of any form of malaria. Frequently these pills can be recovered in the stool, and one can never be sure that the drug is absorbed. Intravenous treatment with quinine and fluids brought about a rapid recovery.

CASE 4.—E. T., a man aged 22, a college student, returned from Africa to the United States on Feb. 15, 1943 by plane. During the previous year he had been with the American Field Service Ambulance Corps. En route to this country he was held up for four weeks in Lagos, Nigeria, a highly malarious area. He arrived in New York on February 18 and became ill on February 22, when he experienced a severe chill.

His physician immediately examined a thin blood film and found a small number of *P. falciparum* parasites. The temperature was 105.6 F. Two 0.1 Gm. doses of atabrine were administered during the first afternoon. On the following day he received three tablets. The temperature did not fall below 104 F., and he was hospitalized. When seen in consultation the patient was delirious at intervals and confused with regard to time. The temperature was 104.4 F. There was slight icterus of the scleras, and the spleen was just palpable.

Quinine dihydrochloride 0.6 Gm. in 20 cc. of distilled water was administered intravenously and repeated after eight hours. Quinine sulfate by mouth was begun simultaneously in doses of 1 Gm. every six hours for the first twenty-four hours. The following day the temperature was lower and the patient seemed much better. Thin films contained no parasites, but examination of thick drops revealed a few rings of *P. falciparum*. Quinine sulfate 1 Gm. by mouth three times a day was continued for the next two days. The dosage was then reduced to 0.6 Gm. three times a day for the next two days. Further treatment consisted of the administration of atabrine 0.1 Gm. three times a day for seven days followed by plasmochin 0.01 Gm. three times a day. After the second day this had to be discontinued because of severe abdominal cramps and cyanosis.

Although the diagnosis was made at the onset of the patient's illness, treatment was not of sufficient intensity. Atabrine requires a large initial dose in order to attain an effective blood level in a short time. A rapidly developing falciparum infection may get out of hand if this is not recognized. In this case there was no predominant localization of symptoms with the possible exception of the brain, and one can consider it a case of severe general infection. This case also illustrates the occurrence of toxic symptoms from plasmochin in relatively small doses.

Gastrointestinal Involvement.—Gastrointestinal symptoms occur fairly frequently in falciparum infections. These symptoms may vary from mild nausea to intractable vomiting or severe diarrhea. Localized or general pain may occur. Patients have been operated on because of suspected intestinal obstruction or other acute abdominal conditions and have been diagnosed as having had malaria only at autopsy.

The presence of severe gastrointestinal symptoms indicates the necessity for intensive parenteral treatment, both specific and supportive.

Diarrhea may be particularly misleading in persons recently back from the tropics. Bacillary and amebic dysentery should be considered, but malaria must first be excluded. If parasites are found, specific treatment will result in a prompt cure of the diarrhea.

CASE 5.—P. C., a man aged 36, returned from Africa to the United States on May 19, 1942. He had been to Africa on numerous occasions to collect animals for zoological gardens and had had numerous attacks of malaria. He arrived in Boston and had a chill with pain in the chest. He was seen by a physician, who thought he might have pneumonia and advised hospitalization, but this was refused because he was in charge of a cargo of animals. The following day he suffered from severe diarrhea and vomiting and had another chill with a temperature of 104 F. He went to New York on May 21. He was seen in consultation, and blood examination showed 60,000 falciparum parasites per cubic millimeter. He was immediately hospitalized. On admission his temperature was 104.6 F. He continued to vomit and was definitely jaundiced. Three 0.6 Gm. doses of quinine dihydrochloride were given intravenously at six hour intervals. The patient's stomach was washed out and 2,000 cc. of saline solution with 5 per cent dextrose was given intravenously. After twenty-four hours the vomiting and diarrhea had stopped, the temperature was normal and the patient appeared much better. Quinine sulfate was then given for two days by mouth in doses of 1 Gm. three times a day after meals. A course of atabrine followed consisting of 2.4 Gm. during the next seven days. Finally, plasmochin 0.01 Gm. three times a day was given for five days.

With a history of numerous previous attacks of malaria and the patient's recent arrival from Africa, malaria should have been considered as a strong possibility even though his first localizing symptom was pain in the chest. Subsequently the predominant clinical manifestation was gastrointestinal.

CASE 6.—A. B. arrived in New York on Aug. 29, 1943 by plane from Africa. En route he remained at Accra for one week. He first became ill on September 6, when he complained of generalized aches, profuse perspiration and a severe chill. When he was seen by his physician the following day, his temperature was 103 F. The only physical finding was herpes labialis. He was placed on sulfadiazine. The following day he began to vomit and had another chill. The physician considered the possibility of malaria at this time and ordered quinine 0.3 Gm. three times a day. He was admitted to the hospital the following day. When seen in consultation he was acutely ill. The temperature was 101 F., and there was moderate icterus of the scleras. The tongue was brown

and dry, and the spleen could be felt easily. The urine contained bile and increased urobilinogen. Examination of thin and thick blood smears revealed no parasites, but many of the monocytes and polymorphonuclear neutrophils contained malaria pigment. Since neither atabrine nor quinine for intravenous use was available and the patient had ceased vomiting, he was given quinine sulfate in capsules 1 Gm. three times a day for two days. Atabrine was then available and was administered in doses of 0.2 Gm. every six hours for five doses followed by 0.1 Gm. three times a day for six days, making a total of 2.8 Gm. Supportive treatment consisted in the liberal administration of intravenous saline solution and dextrose.

In this case severe vomiting and jaundice were outstanding. Specific treatment was not begun until the fourth day of the disease. It is interesting that after two days of sulfadiazine therapy and 2 Gm. of quinine no parasites could be found. It is known that sulfadiazine is partially effective in temporarily lowering the parasite density in *P. falciparum* infections. Probably the use of this drug followed by small doses of quinine accounted for the failure to find parasites in the peripheral blood.

CASE 7.—P. M., a contract engineer, arrived in Miami on March 26, 1943 by plane from Africa. On the same day he had severe chills, fever, vomiting and diarrhea. Hospitalization was suggested, but the patient proceeded to New York. He was seen in consultation on April 2 and stated that while in Africa in May 1942 he had had recurrent attacks of chills, fever and vomiting, for which he had been hospitalized several times. At no time were malarial parasites found in thin films. On one occasion his illness was believed to be prostatic disease.

On physical examination no striking abnormalities were noted. The temperature was 102.6 F. Examination of thick and thin films revealed *P. falciparum* rings and gametocytes. The patient was hospitalized and received quinine sulfate by mouth 1 Gm. three times a day for three days, then 0.6 Gm. three times a day for four days. He was then placed on atabrine 0.1 Gm. three times a day for seven days, followed by plasmochin 0.01 Gm. twice a day for five days. His temperature became normal on the second day and remained so throughout his stay at the hospital.

This patient stated that he had been born and raised in rural Tennessee and had been told that he had malaria as a child. Perhaps he had some immunity, since he was able to control his infection without treatment for a considerable length of time. The symptoms which this patient experienced for approximately eleven months were probably due to malaria, since they all promptly disappeared following treatment.

This case indicates that falciparum malaria may simulate a chronic infection of the urinary tract and then assume an acute stage.

Blackwater Fever.—This is the term applied to the clinical syndrome resulting from spontaneous intravascular hemolysis of red cells occurring in falciparum malaria. The mechanism of its induction is unknown, but it appears that red cells from blackwater fever patients have an increased fragility to lysolecithin, although their fragility to saline solution is normal. Normal red cells transfused into a patient with blackwater fever are destroyed just as readily as the patient's own cells, suggesting the presence of some circulating hemolysin. Predisposing factors seem to be continued residence in hyperendemic areas, numerous reinfections and incomplete and intermittent treatment. Precipitating causes are chilling, pregnancy, acute infections, trauma and quinine.

The outstanding clinical feature is the passage of dark red, brown or black urine containing oxyhemoglobin

and methemoglobin. In severe attacks jaundice, anemia and azotemia, and anuria occur. In mild attacks, however, abdominal and loin pain may be slight and clinical jaundice absent. Death may result early in the attack as a result of anoxia or later as a result of complete urinary suppression.

Blackwater fever occurs more commonly in hyperendemic areas of falciparum malaria. Occasionally a case is seen in the United States, but in most cases seen in this country the disease was acquired in the tropics and the attack follows shortly after arrival in a nonendemic area. One must therefore assume that hemoglobinuria in patients who have recently returned from the tropics is due to falciparum malaria. Blood examination cannot be depended on for diagnosis, because parasites sometimes cannot be found during the acute attack.

CASE 7.—C. L., a white man aged 20, was removed from the Seamen's Home in New York City to the psychiatric division of Bellevue Hospital because he was confused. On admission the patient stated that he had been sick for four days with chills, pain in the abdomen and flanks, nausea and vomiting. He had been in South America three weeks previously and thought that he had malaria on several occasions for which he had taken quinine intermittently but not during the past few months. The patient was apathetic and restless. His temperature was 103 F. There was pronounced costovertebral tenderness on both sides. Blood smears contained numerous rings of *P. falciparum*. The urine was dark red and contained large amounts of oxyhemoglobin and methemoglobin. Subsequent specimens varied from deep red to brown and almost black. He received several blood transfusions and large amounts of fluid intravenously. In addition he received atabrine by mouth in doses of 0.2 Gm. three times a day for the first three days and then 0.1 Gm. three times a day for five additional days. He became afebrile, and the urine returned to normal. He was discharged from the hospital thirteen days after admission.

In this case blackwater fever occurred either in the course of a recently acquired falciparum infection or during an early relapse. Prompt supportive treatment in the form of fluids and whole blood was successful in tiding the patient over during his period of intravascular hemolysis. Specific treatment against his malarial infection consisted of 3.3 Gm. of atabrine given in the course of a week.

Algid Form.—Occasionally one sees in acute falciparum infections a so-called algid variety. The patient collapses suddenly and presents the picture of medical shock. He may be afebrile. Unless one considers the possibility of malaria in this condition and institutes heroic treatment immediately, the patient usually dies within a short time.

DIAGNOSIS

The diagnosis of falciparum malaria depends essentially on finding the organisms in the blood and the identification of the species. Thin smears require proper staining, which should be heavier than is necessary for differential white blood cell counts in order to avoid missing the ring forms. A single negative thin film should never be depended on to exclude the diagnosis. Col. D. K. Lindsay³ has aptly said "A negative blood slide has sent many to the grave." If necessary, smears should be repeated at intervals of twelve to twenty-four hours to insure discovery of parasites. In blackwater fever parasites may not be found at all during the acute attack. The examiner must be able to differentiate between malaria parasites,

platelets, bacteria and other artefacts. In heavy infections monocytes and neutrophilic granulocytes may contain malaria pigment even in the absence of parasites. This is diagnostic and indicates a serious infection.

Thick drop preparations should be employed in every case in which the thin film is negative. In fact, every laboratory technician should be acquainted with the thick drop technic, and physicians should employ it routinely.

The characteristics of *P. falciparum* parasites as they appear in the peripheral blood must be borne in mind. Early in the infection one usually finds only the ring forms. These are usually small delicate rings and are frequently implanted at the margin of the red cell. Multiple infection of a single red cell is common. Double chromatin dots often occur and frequently are found at opposite poles of the ring. After the first week of symptoms one may also find the characteristic crescentic gametocytes. Thus in falciparum infections one usually finds only rings or gametocytes or both. In overwhelming infections, especially if the patient is in shock, one may find schizonts in the peripheral blood. The presence of malaria pigment in white blood cells is suggestive of heavy falciparum infection.

Clinically malaria should be suspected in any person with any complaint whatever if he has recently returned from the tropics. As has already been pointed out, the clinical manifestations may not be suggestive of malaria at all, and if one waits for the development of characteristic chills and fever it may be too late to begin successful treatment. Fever may be entirely absent even in overwhelming infections, and when fever does occur the temperature curve may not follow the usual pattern which we commonly associate with malaria. The white blood cell count or differential formula is not a reliable aid to diagnosis. We have seen white counts which were as low as 3,250 and as high as 46,000. Monocytosis may not be increased. Anemia may not have developed or may be very severe with the red count between 1 and 2 million. On the other hand, in overwhelming and even fatal infections there may be no evident anemia. Splenomegaly is not a constant finding in acute falciparum infection. When it does occur, enlargement does not reach the proportions which is usually seen in vivax malaria. Frequently even when the spleen is considerably enlarged, as demonstrated at autopsy, it may not be felt during life, possibly because it is very soft.

Thus it can be seen that it is impossible to present a clinical description of falciparum infection which will cover all its manifestations. The diagnosis can be made only if it is kept in mind and if suitable steps are taken to confirm it.

TREATMENT

In the treatment of falciparum infections it is very essential to start early and to use suitable drugs in sufficient dosage to insure an early and effective plasma concentration. An excellent statement on treatment can be found in Circular Letter 153 from the Surgeon General's Office, published in *THE JOURNAL*, Sept. 25, 1943,⁴ and every physician is advised to keep this statement on hand for reference. All physicians should make sure that the hospitals in which they work have on hand atabrine hydrochloride in tablets for oral use and in ampules for intramuscular injections, and

3. Lindsay, D. K.: Guidance Notes on Pernicious Malaria, *Tr. Roy. Soc. Trop. Med. & Hyg.* 37: 63 (July) 1943.

4. The Drug Treatment of Malaria, Suppressive and Clinical, circular letter no. 153, Office of the Surgeon General, U. S. Army, *J. A. M. A.* 123: 205 (Sept. 25) 1943.

quinine dihydrochloride in ampules for intravenous use. Frequently small hospitals and rural pharmacies do not have these drugs on hand, and valuable time is lost in procuring them.

For the oral treatment of falciparum malaria physicians must depend almost entirely on atabrine. This drug, if properly used, is as effective as quinine by mouth in controlling infections, and its toxicity is minimal. It must be borne in mind that the drug is an acridine dye and frequently produces a yellowish discoloration of the skin, but this is not a sign of toxicity and is not an indication for altering or suspending treatment. The discoloration disappears a few weeks after cessation of treatment.

Totaquine (U. S. P. XII), a crude extract of the crystallizable alkaloids of cinchona, is advocated and is becoming available as a substitute for quinine in oral medication. It is effective in doses 50 per cent larger than those advocated for quinine. It should be used, however, only in vivax and malariae (quarant) infections and in mild or chronic falciparum cases.

Treatment of Uncomplicated Infections.—In the treatment of mild uncomplicated falciparum infections atabrine by mouth is recommended. During the first twenty-four hours two tablets of 0.1 Gm. each are given every six hours for five doses, making a total of 1 Gm. in the first twenty-four hours. Gastrointestinal symptoms are largely avoided if the drug is given with food or sweetened fluids. Following this, one tablet of 0.1 Gm. should be given three times a day after meals for at least six days, making a total of 2.8 Gm. in seven days.

If the patient cannot take atabrine, totaquine may be used in doses of 1.5 Gm. three times a day after meals for three days, followed by 1 Gm. three times a day for four days. In some hospitals or pharmacies quinine sulfate may still be available in small amounts for the treatment of malaria. If no other drugs are available or if atabrine cannot be tolerated, quinine sulfate in capsules or disintegrating tablets can be given. The initial dose for the first three days should be 1 Gm. three times a day followed by 0.6 Gm. three times a day for at least four days. Quinine should never be given in sugar coated pills. Rapid absorption may be assured by the addition of a few minims of dilute sulfuric acid to each dose of quinine.

Treatment of Complicated Infections.—In the presence of complications, such as vomiting, diarrhea or manifestations of central nervous system involvement, or in infections in which the parasite density is 50,000 per cubic millimeter or more, atabrine dihydrochloride should be given intramuscularly in solution, 0.2 Gm. in each buttock, making an initial dose of 0.4 Gm. This can be repeated for an additional one or two doses at six hour intervals. Treatment by mouth should be started as soon as the patient can retain oral medication. The dosage schedule should be such that the combined amounts from parenteral and oral therapy total 1.0 Gm. during the first twenty-four hours. Subsequent treatment consists of 0.1 Gm. three times a day after meals until a total of 2.8 Gm. has been given in one week. If atabrine is not available for parenteral use and the patient requires parenteral treatment, quinine dihydrochloride should be used intravenously. The initial dose should be 0.6 Gm. in an infusion of 200 cc. of 5 per cent dextrose in isotonic solution of sodium chloride. Quinine by vein should always be administered very slowly, since rapid injection may produce a definite fall in blood pressure. In high

concentrations given quickly it may act as a direct cardiac poison. Epinephrine solution 1:1,000 should be on hand and if collapse occurs 1 cc. should be given intravenously. Intravenous therapy may be repeated every four to six hours until the patient is clinically well enough to continue medication by mouth. If at this time atabrine is available, 1 Gm. is administered during the first twenty-four hours in five divided doses of 0.2 Gm. each followed by 0.1 Gm. three times a day for six days. If atabrine is not available as soon as clinical improvement warrants oral therapy, quinine sulfate 1.0 Gm. or totaquine 1.5 Gm. in capsules should be given three times a day after meals for three days and then quinine sulfate 0.6 Gm. or totaquine 1 Gm. three times a day for four additional days.

Treatment of Comatose Patients.—Quinine dihydrochloride 0.6 Gm. should be given intravenously every four hours until it is evident that the patient is no longer critically ill. Atabrine is then begun in the manner already prescribed so that 2.8 Gm. is given in seven days. Spinal drainage may restore the patient to consciousness and should be performed. Fluids by vein should be administered freely so that the specific gravity of the urine is 1.010 or less. There is evidence that nicotinic acid (not nicotinic acid amide) produces dilatation of cerebral capillaries and increases cerebral blood flow.⁵ It seems rational to include 100 mg. of nicotinic acid in the infusion containing each dose of quinine dihydrochloride to facilitate the penetration of the drug to the parasitized capillaries in which the effective lumen is reduced. If necessary nicotinic acid may be given intravenously every hour to maintain cerebral capillary vasodilatation. In 1 case this procedure restored consciousness immediately.

Treatment of Blackwater Fever.—Steps should be taken to prevent the precipitation of acid hematin, which may result in anuria. Sodium bicarbonate should be given, by mouth if possible, to maintain an alkaline urine. If necessary it may be given intravenously in the form of an infusion of 500 cc. of a 2 per cent solution in isotonic solution of sodium chloride. If anemia is severe or if the initial hemolysis produces severe anoxia, repeated transfusions of whole blood are indicated. Dextrose or plasma should be given freely to maintain a normal water balance and to stimulate urinary output. If parasites are present in the peripheral blood, atabrine is advised in the dosage already given.

Symptomatic Treatment.—This should include steps to insure restoration of salt and water metabolism to a normal state. In the presence of vomiting, the stomach may be washed out and subsequently liberal amounts of 5 per cent dextrose in isotonic solution of sodium chloride given intravenously so that the specific gravity of the urine is not above 1.010. If anemia is very severe, blood transfusions may be resorted to. In all cases of anemia, iron in the form of ferrous sulfate 0.3 Gm. three times a day after meals should be given as soon as possible.

INSTRUCTION OF PERSONS RETURNING FROM THE TROPICS

Every passenger and crew member of an airplane returning from a malarious region should be instructed to obtain medical attention on the first development of

5. Aring, C. D.; Ryder, H. W.; Roseman, Ephraim; Rosenburt, Milton, and Ferris, E. B., Jr.: Effect of Nicotinic Acid and Related Substances on the Intracranial Blood Flow of Man. *Arch. Neurol. & Psychiat.* 46: 649 (Oct.) 1941. Loman, Julius, and Myerson, Abraham: Alcohol and Cerebral Vasodilatation, *New England J. Med.* 227: 439 (Sept. 17) 1942.

any symptoms of illness, even those of a common cold. Such instruction should be the responsibility of the steward on the plane. It can be accomplished by presenting to each passenger and crew member a card of convenient size carrying a carefully worded statement that he has probably been exposed to infected mosquitoes, that the disease may develop in a serious form within a few days or weeks, that the symptoms may be indefinite, and that he should have a physician examine his blood for malaria on the first appearance of any symptoms. Airplane companies and military departments should realize their responsibility for preventing fatalities from malaria and should be urged to provide such instructions for early diagnosis.

SUMMARY

Physicians throughout the United States may be confronted with the diagnosis and treatment of civilians recently returned from the tropics. Unless malaria is considered as a possibility in every case no matter what the symptoms, the disease may be overlooked and may progress to a point at which treatment is of no avail.

Every patient returning from the tropics should have a thick and thin blood smear examined for malarial parasites, and if negative this should be repeated every twelve to twenty-four hours until malaria is confirmed or excluded.

If the diagnosis of malaria is not made but the condition of the patient progresses unfavorably, specific treatment for malaria should be instituted. Such treatment should not interfere with other diagnostic procedures, cannot hurt the patient and may prevent fatalities. Search for parasites should be continued.

The clinical manifestations of falciparum malaria may not follow any given pattern. The symptoms of onset are most frequently mistaken for infections of the upper respiratory tract and various gastrointestinal disorders. Severe vomiting or diarrhea and signs or symptoms of cerebral involvement require intensive parenteral treatment.

Atabrine by mouth is recommended in all uncomplicated falciparum infections.

In cases of severe parasitemia or evidence of visceral localization, atabrine should be given intramuscularly or quinine intravenously. Such treatment must be started early and continued with intensity until there is sufficient clinical improvement to warrant changing to treatment by mouth.

In coma or predominant cerebral localization, quinine dihydrochloride should be given intravenously every four hours with dextrose solution and isotonic solution of sodium chloride. Spinal drainage may be useful in restoring consciousness. Nicotinic acid intravenously is recommended to produce dilatation of cerebral capillaries.

Only serious consideration of the possibility of malaria in illnesses occurring among patients with a history of recent residence or travel in the tropics and early intensive treatment will prevent serious complications and fatalities.

Passengers and crew members of all airplanes returning from malarious regions should be warned to obtain a blood examination for malaria at the onset of any illness.

477 First Avenue.

PRODUCTION OF BLOOD DERIVATIVES TO MEET WAR REQUIREMENTS IN GREAT BRITAIN

WITH A NOTE ON THE LARGE SCALE
PREPARATION OF A DRIED PRODUCT

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In a country at war the choice of a blood substitute and its preparation must be considerably influenced by the special circumstances of the moment. The present review describes briefly the various phases through which this subject has passed during the last four years and the position reached at the present time.

With the return of peace it may well be that many different blood substitutes will be brought forward, but the assessment of their relative merits will entail much clinical trial and experience.

Stored whole blood has but a limited life and therefore cannot be made universally available; moreover, there are certain conditions such as burns in which the circulatory volume is reduced without a corresponding reduction in the number of red cells and in which a transfusion containing red cells may not be beneficial. Certainly in war and probably also in peace there is a definite need for a stable "blood" substitute which will restore and maintain the blood volume. Intravenous saline solution has long been used and, though in some instances its effects have been dramatic, its failing is that the injected crystalloid rapidly diffuses into the tissues and so the beneficial effect is but transitory. For this reason infusions of saline solution and acacia were introduced during the last war because the colloid osmotic pressure exerted by the acacia rendered the beneficial effects of the saline solution more lasting. But apparently the acacia was not removed from the body and there is some evidence that the retained acacia may lead eventually to liver damage.

Nature's method of retaining fluid in the circulation is by the colloid osmotic pressure exerted by the plasma proteins. Animal plasma protein is readily available in ox and horse plasma, but these proteins are foreign to man and their use involves all the problems of the sensitization of the individual.

Early in 1940 it was appreciated from the work of American observers that human plasma and possibly serum might meet the urgent demands which were being made for a blood derivative. Since in England it is essential to maintain large blood banks owing to the possibility of many air raid casualties occurring in any part of the country, human plasma is available in large amounts as a waste product from such banks.

It is essential that the blood derivatives should be really stable and free from infection. Liquid unfiltered plasma or serum is undoubtedly more stable than whole blood, but on storage the plasma tends to clot and both throw down a flocculent precipitate. This instability is moreover accentuated by the shaking which occurs during transport and by fluctuations in temperature. Shaking can be minimized by filling the bottles completely, but storage in equitable temperatures is not practicable under service conditions. Further, both plasma and serum are excellent culture mediums and the odd organism which may escape detection on routine bacteriologic examination will multiply to formidable proportions before the bottle is used. This is a real danger,

From the Drying Unit of the Medical Research Council.

since detection of infection by naked eye inspection, which is the only method available to the clinician, may prove difficult in a material which is normally opalescent and in which precipitation naturally occurs.

Sterility could, on theoretical grounds, be ensured by the addition of an antiseptic such as merthiolate, but Mackay¹ has shown that no antiseptic is available at present which, if used in sufficient strength to assure sterility, might not be considered dangerous to the patient who received a large infusion of such a fluid.

The danger of infection is greatly reduced, though not eliminated, by Seitz filtration. After a short trial of unfiltered plasma, workers in England insisted that liquid serum or plasma should not be used unless it had been Seitz filtered, since Seitz filtration gave a clear fluid in which any cloudiness or precipitation due to infection could be detected. Further, there was some evidence (which has since been proved to be incorrect) that if the icogenic factor was present it might be removed by Seitz filtration. Clinicians were instructed not to use liquid serum or plasma which was cloudy or showed a precipitate. This, while eliminating the danger of giving infected material, had the result that after a few months storage all the material was returned to the blood depots because of the natural precipitation which inevitably occurred. Seitz filtration, though essential from the point of view of sterility, introduced a major difficulty in the preparation of plasma, for it adversely affects its stability and leads to clotting.

At the beginning of the war there was much controversy over the relative merits of serum and plasma. Those who favored plasma claimed that serum was toxic, citing the experiments of Brodie² on the injection of homologous serum into cats; they also stated that the absence of fibrinogen might result in serum being a less valuable fluid than plasma. Owing to the difficulties encountered in filtering plasma, and since at that time it was essential to produce a blood product rapidly and in quantity, large amounts of filtered serum were used and the expected fears were not realized clinically. Nothing simulating the Brodie phenomenon has been observed in man. Reid and Bick³ have shown that serum and plasma tend to possess smooth muscle contracting substances and that normally serum contains these factors in larger amounts than plasma. It is not clear that clinically these factors may not have their value, but experiment has shown that these pharmacologically active substances are minimal in serum if the serum is prepared by clotting plasma or in clotted whole blood if the clots are kept cold and separation and Seitz filtration are carried out as speedily as possible. Those who favor serum cite the difficulties of filtration, the instability and dilution of filtered plasma and the possible harmful effects of the citrate.

If plasma is to be collected, 420 cc. of blood is drawn into 120 cc. of dextrose citrate solution. If the bottles are allowed to stand in the cold room the cells sediment and about 250 cc. of plasma can be siphoned off; this represents about 14 Gm. of protein in a 5.6 per cent solution. The yield is not greatly increased by centrifuging the bottles but can be increased by the use of the alpha Laval separator; the use of this separator is, however, restricted to fresh blood, for blood which has been stored for more than three days is grossly hemolyzed by this procedure.

If serum is required, 540 cc. of blood is collected in a dry bottle, the blood allowed to clot and the serum poured or siphoned off, giving a yield of about 40 per cent, or 215 cc. of a 7 per cent protein solution or 15 Gm. of protein. Thus, since one can bleed more into the standard bottle when dry, in spite of the lower yield, actually more protein can be obtained from the donor who is bled for serum.

The serum or plasma is separated into 2 liter pools, all groups being mixed. A bacterial count is done on these pools prior to filtration; theoretically no contaminated pool should be used, but as a wartime measure material containing less than 100 organisms per cubic centimeter is accepted provided it does not contain pathogenic organisms. The fluid is next clarified through a cotton pulp filter and then passed through a Seitz filter press. If the material is serum, this offers no difficulties; but plasma will clot unless special precautions are taken.

The first method of overcoming this difficulty with plasma was the rapid filtration method of Macfarlane and his collaborators.⁴ This method up to a point was satisfactory but was wasteful in filter pads, and the filtered material was liable to undergo delayed clotting particularly if kept in the cold. To overcome this the "alkali wash" method was introduced by Bushby, Buttle and Whitby.⁵ This method undoubtedly achieved its end but was clumsy to operate and if, after washing through the filter, the plasma was collected too soon serious dilution occurred; if too late there was serious wastage of plasma. This method as carried out by different workers met with varying success. Bushby and Whitby⁶ then introduced the "alkali" process; this method is undoubtedly simpler than the "alkali wash" method, but the material is very liable to precipitate especially on transportation, and there appears to be some alteration in the plasma proteins.

Liquid serum and plasma were both used successfully in the raids of 1940-1941, but they were not ideal products for the reasons mentioned. Many attempts have been made to produce a more stable liquid, of which the most successful in this country has been the low temperature ether extraction method of Macfarlane;⁷ after this process a beautifully clear product results which has lost its lipoids and which remains clear from clouding and precipitation for some months—the actual time awaits the results of observation now in progress. Moreover, if plasma is treated by this method the fibrinogen is removed, so that filtration can be effected without the risk of clotting.

Where it has been possible to hold the liquid material in the frozen state this method has been tried, but even in warm water the bottles take at least half an hour to thaw, and when the supplies are wanted in a hurry this is too long a period; moreover, under war conditions it may be that all forms of heat have been cut off by bombing, in which case the material will not be available for several hours and this slow thawing will then cause the precipitation of fibrin in the plasma—an accident which would also occur following any prolonged refrigeration failure. This method, therefore, has found little favor.

4. Macfarlane, R. G.; Macsween, J. C.; Mainwaring, B. R. S., and Parish, H. J.: *Technic for the Filtration of Human Plasma and Serum for Transfusion*, Brit. M. J. 1: 377 (March 21) 1942.

5. Bushby, S. R. M.; Buttle, G. A. H., and Whitby, L. E. H.: *Small Scale Filtration of Citrated Plasma*, Lancet 2: 131 (Aug. 3) 1940.

6. Bushby, S. R. M., and Whitby, L. E. H.: *Certain Properties of Plasma, with a New Method for Large Scale Production of a Nonclotting Product*, J. Roy. Army M. Corps 78: 255 (June) 1942.

7. Macfarlane, A. S.: *Annual Report of the Governing Body of the Lister Institute*, 1943, p. 10.

1. Mackay, Margaret E.: *The Bacteriostatic Effect of Disinfectants in Human Serum and Citrated Plasma*, Lancet 1: 747 (May 17) 1941.
2. Brodie, T. G.: *The Immediate Action of an Intravenous Injection of Blood Serum*, J. Physiol. 26: 48, 1900.
3. Reid, G., and Bick, Marjorie: *Pharmacologically Active Substances in Serum*, Australian J. Exper. Biol. & Med. Sc. 20: 33 (March) 1942.

Though liquid serum and plasma are unstable, in the dry form they appear to be completely stable and can be transported anywhere and stored in any climate; moreover, if required the dried product may be reconstituted in a concentrated form.

The dry product has the disadvantage that there is no decrease in its bulk; in fact, as the solvent has also

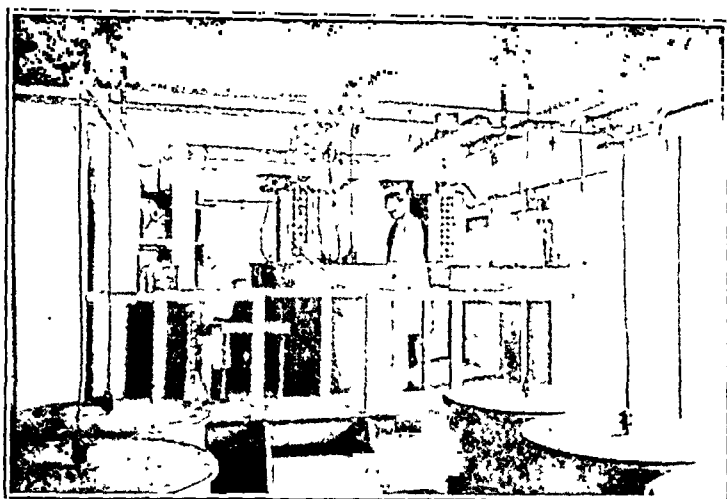


Fig. 1.—General view of the desiccator room, showing the secondary desiccators in the foreground and the primary desiccators with the loading staging in the background. The heater heads from the two chambers which are defrosting are raised.

to be transported the bulk is actually increased; moreover, the extra manipulation of making up the dried product, although it occupies only half a minute, is a disadvantage. On solution also the dried product is cloudy, owing to an alteration of the lipid distribution. This can be avoided by a preliminary low temperature ether extraction, but since clinically this cloudiness seems to be of no significance the extra complication of the ether extraction would not appear to be justified as a wartime measure, though obviously in peacetime the elegance of the preparation would justify the extra cost and complication of the process.

Although liquid serum and plasma were extensively and successfully used for civilian casualties, on account of their instability they were less satisfactory for the services, which therefore had to have priority on the limited supplies of the dried product that were available. The advantages of a really stable product were, however, so great that further drying facilities were made available, and now it may be said that in this country they are probably sufficient to meet the day to day demands of the war situation both for the services and for the civilian population. The time has come, therefore, to consider whether technical methods should not be developed which would allow plasma and serum to be dried without filtration, and this possibility is being borne in mind. Conditions might arise, however, when for a short period at any rate the drying facilities could not meet the demands which would then have to be met by the issue of liquid material. It is thus still important from the point of view of the war effort that experiments on the production of a stable liquid product should continue, apart from their intrinsic interest as a problem in protein chemistry.

It is probable that experience in blood banking methods will lead to a great decrease in the amount of time expired blood that is turned over to the processing plants, and that in order to meet the demands for a blood derivative donors will be bled specifically for this purpose. Since a really satisfactory method for filtering plasma still remains to be found, the tendency in this country is already to keep the amount of waste blood

bank plasma to a minimum and to bleed donors for serum to meet the need for a blood derivative. In this way the advantages that serum has when compared with plasma, namely a higher protein content, no added chemicals and ease of filtration, can be utilized. Owing to the shortage of supplies and of skilled personnel, no attempt has as yet been made in this country to produce purified albumin by the alcohol method of the Harvard group, nor has any attempt been made to find substitutes for human protein such as bovine albumin, gelatin, isinglass, pectin or casein hydrolysates.

THE DRYING OF SERUM AND PLASMA

The drying plant at present operated by this unit is based on the experimental model of Greaves and Adair⁸ and on the experience gained with several similar plants of intermediate size. The capacity of the plant is 2,500 bottles each containing 400 cc. per week; provision is made for doubling this output if required.

The bottles of liquid serum or plasma first have their metal caps removed, and these are replaced by a special "drying cap." These consist of a layer of cotton wool between two layers of muslin fixed over a perforated metal cap with a steel ring. These caps will allow the passage of water vapor but prevent the entry of bacteria into the bottles. Thus if this change of caps is carried out with sterile precautions the bottles can be taken through the whole drying process without risk of contamination. The bottles after capping are placed in a cold room at $+2^{\circ}\text{C}$. to precool over night.

The next day the bottles are "spun frozen."⁹ In this process 108 bottles at a time are spun on their vertical axes at a speed of 900 revolutions per minute in a cold room maintained at -18°C . Under these conditions a cone is forced down through the fluid, which is flung to the periphery of the bottle, where it freezes, thus exposing a maximum surface for evaporation during the drying process together with a minimum depth of frozen material. Under these conditions the plasma freezes with a very small crystal size, and this has the effect of making the dried material extremely rapidly

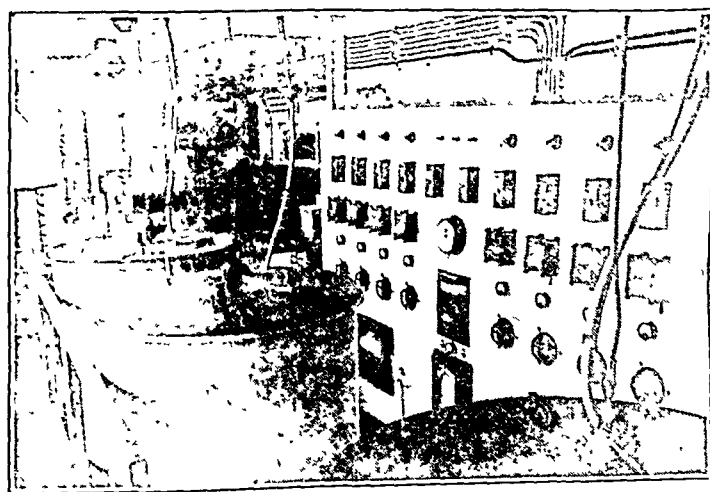


Fig. 2.—General view of desiccator room, showing the drying control panel on the right.

soluble, the solution time of the dried product being less than half a minute.

The "spun frozen" bottles are then transferred to a storage room maintained at -25°C . This room has a capacity for storing 5,000 bottles, or fourteen days'

8. Greaves, R. I. N., and Adair, Muriel E.: High Vacuum Condensation Drying of Proteins from the Frozen State, *J. Hyg.* **39**: 413 (July) 1939.

9. Greaves, R. I. N.: The Freezing of Human Serum and Plasma in Medical Research Council Transfusion Bottles, Before Drying by Sublimation from the Frozen State, *J. Hyg.* **41**: 489 (Dec.) 1942.

supply, and so acts as a buffer between fluctuating supplies and the drying plant.

The drying apparatus consists of eight steel vacuum chambers 3 feet in diameter by 6 feet high. In the bottom of each chamber is a steel coil through which brine cooled to between -41 and -44 C. is circulated. The lid of each chamber has attached to it a nest of 180

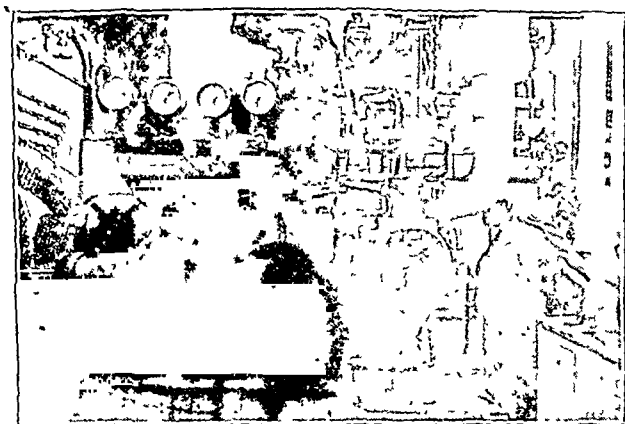


Fig. 3.—View of the engine room showing the two automatic compounded ammonia refrigerator compressors

tins into which the bottles fit, and round each tin is an electric winding used for heating the bottles during desiccation. The amount of heat used, $1\frac{1}{4}$ kilowatts per chamber, is regulated so that the drying cycle takes three days. Thus two chambers are loaded and two chambers are unloaded each day.

The eight chambers are connected by a common manifold to two 3 horsepower single stage vacuum pumps; these pumps are backed by small single stage pumps. During evacuation of a chamber both pumps are used, but after this one pump will maintain the six chambers which are in operation at a vacuum of 0.15 mm. of mercury (Pirani).

In each chamber is a control bottle containing a thermocouple which records the temperature of the material being dried. During loading and evacuation the temperature of the serum rises to -20 C., but once the critical vacuum (about 1 mm. of mercury) is passed the temperature starts falling, owing to the latent heat of evaporation of the ice. When the temperature reaches -30 C., heating is started and the temperature rises to -22 C., where a state of equilibrium is obtained till the material is nearly dry. At this stage the temperature starts rising, and when the plasma is dry this temperature is allowed to rise to $+30$ C. at which it is maintained thermostatically.

On unloading, the evaporated water is found as ice on the refrigerated coils at the bottom of the desiccator, this ice is thawed by circulating heated brine through the coils, the water is removed and the dry chamber is made ready for reloading the next day.

On removal from these primary chambers the dried material contains 0.4 per cent of its dry weight of residual moisture. This is removed by placing the bottles in a secondary desiccating chamber in a high vacuum over phosphorus pentoxide for two days. After these two days of further desiccation the bottles are removed and their drying caps replaced with a rubber washer covered with a screw-down metal cap which has a small hole punched in its center; a sterile hypodermic needle plugged with cotton wool is then stuck through the hole in the metal cap and the rubber washer, and the bottles are returned to the secondary desiccators

for a further two days desiccation in vacuum. About 1 Gm. of phosphorus pentoxide is required for each bottle for the whole of this secondary stage desiccation. Finally the vacuum in the secondary chambers is replaced with pure dry nitrogen to a slightly positive pressure; the chambers are then opened and the needles pulled out of the bottles, which are now absolutely dry and packed in pure dry nitrogen. The holes in the metal cap and the rim are now sealed with plasticine and the bottle neck finally dipped in a "Perspex" lacquer to give a hermetic seal.

Thus each bottle takes seven days to go through the whole drying cycle, and the output is 360 bottles per day or 2,500 bottles per week. Provision is made to double this output, if required, by running a shorter schedule.

Refrigeration is required for the drying chambers, the spinning room and the storage room. This is provided by circulating cold brine from a common tank maintained at between -41 and -44 C. by two compounded ammonia compressors. Normally one compressor can balance the whole load, the other acting as a reserve standby.

In the event of a prolonged mains failure, which has to be considered in wartime, a petrol motor is arranged to operate one of the vacuum pumps and another petrol motor will operate the pump circulating the brine through the primary desiccators. With a store of 6 tons of cold brine in the tank, it is estimated that the mains would have to fail for longer than twenty-four hours to cause any serious difficulty.

An alarm system operates in the event of a mains failure, if the brine temperature rises to -40 C. or if the vacuum rises to 0.2 mm. of mercury (Pirani). When the alarm system operates, all heater circuits are immediately switched off automatically. This alarm system has proved a great saving in manpower, since only one person need be on duty at night; and, since he can sleep, he is able to work the next day. In fact, it has been one of our main considerations in designing this plant that it should require a minimal personnel

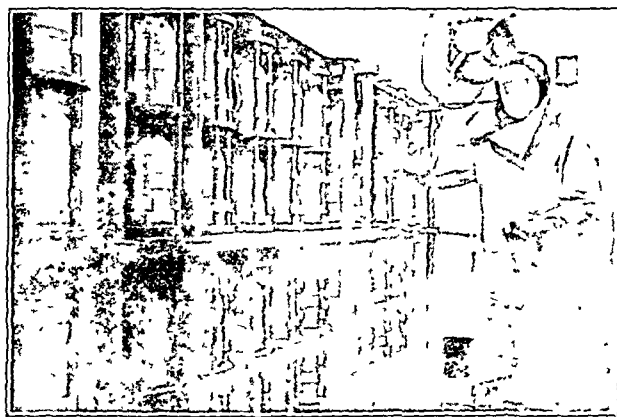


Fig. 4.—The freezing room, showing the apparatus for "spin freezing," 108 bottles each containing 400 cc. of fluid. The fan in the background circulates the air over the freezing unit, which is behind the diaphragm, maintaining the temperature of the room at -18 C.

to operate it and, by making the plant simple and automatic, the staff for continuous running seven days a week has been kept to five men, three skilled, two semiskilled; one mechanic on half time, and eight unskilled women. Since it requires just less than 2 units of electricity to freeze, store and dry each bottle, the process is cheap to run.

PROSTATIC CARCINOMA TREATED BY ORCHIECTOMY

A SECONDARY REPORT BASED ON SEVENTY-FIVE
CASES OBSERVED FOR AT LEAST TWENTY-ONE
MONTHS FOLLOWING OPERATION

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AND

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Fifteen months ago a follow-up study was conducted on 75 cases of prostatic carcinoma treated by orchiectomy in the University Hospital, and the data published in *THE JOURNAL* (Dec. 5, 1942). The present report is concerned with a subsequent follow-up study made on the same series of cases, and twenty-one months or more have now elapsed in each case since operation. The advantage of following a closed series of cases until the death of the last survivor is obvious; and although this series is numerically a relatively small one, we believe that any obvious trends that are observed in its study might be of value in treating future cases.

All the patients in this series except 4 had infiltrating carcinoma. Forty-three were suffering from pain, cachexia or other clinical manifestations of advanced cancer, and the remaining 32 all had obvious primary lesions but were not suffering subjective disturbance from metastases even though some of them were shown by x-ray examination or by phosphatase determination have bony involvement.

CLINICAL RESPONSE TO ORCHIECTOMY

Pain.—The most spectacular feature of these cases is the early and satisfactory relief of pain, which occurs in from twenty to seventy-two hours in most instances in which relief is obtained. We have observed 2 or 3 exceptions to this general rule, however, in cases in which relief of pain came on very gradually after a period of several weeks. Forty-two of the patients complained of pain on admission. Five of the patients obtained no relief whatever following operation, while 27 have obtained complete relief of pain and 10 obtained partial relief.

Weight.—Eighteen patients complained of significant weight loss on admission to the hospital. Thirteen of these regained their weight losses; however, 38 additional patients had appreciable gains in weight following orchiectomy, some gaining as much as 50 to 60 pounds (about 25 Kg.). There are doubtless many factors which contribute to these postcastration increases in weight.

Urinary Obstruction.—Fourteen patients complained of difficulty with voiding or complete retention of urine on whom orchiectomy was performed and on whom no operation for the relief of prostatic obstruction was carried out. Five of these patients were placed on suprapubic drainage at the time of orchiectomy and all of them were eventually able to urinate satisfactorily so that the cystotomy tubes were removed. Nine patients at the time of orchiectomy complained of significant difficulty with urination, and all have experienced more normal urination subsequent to castration.

Transverse Myelitis.—Two patients were admitted to the hospital complaining of severe metastatic pain and

complete transverse myelitis below the mid-dorsal level. Both had complete relief of pain and complete return of neuromuscular function following orchiectomy, and both patients have subsequently had a recurrence of symptoms and have died.

SUMMARY OF RESULTS

Ten of the patients in this series derived no benefit whatever from orchiectomy; 5 died within six months of operation while 4 died during the ensuing fifteen months and 1 is still alive twenty-two months after castration.

Sixty-five of the patients were improved clinically by orchiectomy, but many of these have derived only temporary benefit. Duration of clinical improvement in the delayed failure group has been variable and we have found no criteria for predicting the prognosis in any case. Comparison of data compiled fifteen months ago and now is as follows:

At the time of the first report there were 20 failures, including 5 dead, and since that time 21 additional patients have had a recurrence of symptoms. One third of the patients have now died of their primary disease, 20 having died during the past fifteen months.

At the present time 34 of the patients continue to enjoy a favorable response to orchiectomy. These are all free from pain and cachexia or other subjective manifestations of extensive carcinoma, and in most

Results by Groups

	Group 1		Group 2	
	Cases	Per Cent	Cases	Per Cent
Alive and well.....	22	68.7	12	28
Failures living.....	6	18.8	10	21
Failures dead.....	4	12.5	21	48
Total.....	32	100.0	43	100

instances the objective signs of their disease—size of the primary tumor, hardness of the prostate gland, x-ray evidence of metastases, serum phosphatase levels—have remained at a measurably improved level since operation. However, all of the favorable response cases, with 4 exceptions, continue to show unmistakable clinical signs of prostatic cancer, a fact which affords additional evidence to suggest that orchiectomy provides only temporary suppression of neoplastic activity. Since the control of prostatic cancer activity by hormonal modifications as now practiced is only temporary and since consequently the resulting clinical improvement is palliative and not curative, one might logically raise the question as to the most favorable time for instituting this form of therapy: Should castration be performed in all cases as soon as the diagnosis of prostatic cancer is established, or should it be delayed until the clinical manifestations of advanced malignancy have developed? In answering this question the following facts should be borne in mind: Prostatic carcinoma is notoriously variable in its rate of growth and spread and many patients having bony metastases survive comfortably for years without any treatment whatever. Undoubtedly endocrine therapy suppresses the neoplastic development of both early and advanced cases and in each instance it produces a corresponding prolongation of life but it does not permanently retard the growth of the primary tumor nor does it prevent the occurrence or the eventual progression of metastases. Likewise castration in early cases does not preclude the eventual development of terminal pain and cachexia. It therefore would appear rational to delay the insti-

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1. Six cases are here included in which pain was evidenced from local neoplastic extension, but these cases are not included in the group of 43 cases of advanced neoplasm herein reported.

tution of endocrine therapy until pain or cachexia develops, for only by this means can the patient hope to derive the dual benefits of this treatment, viz. prolongation of life by suppression of carcinogenic activity and relief of pain. The employment of this therapeutic agency at a time prior to the onset of symptoms would appear to be premature, for then it might deprive the patient of significant clinical benefits. So it seems apparent that accurate timing is required for the most economical expenditure of hormonal control.

The present series of 75 cases has been broken down into two groups for the purpose of comparative study. Those in which there were no symptoms of advanced disease at the time of castration comprise group 1, while those in which pain, cachexia or other complaints were present make up group 2. They are summarized in the table.

In group 1 the high survival rate is not unexpected or surprising. Bumpus studied 1,000 cases of prostatic cancer at the Mayo Clinic in 1926 and found that the average survival period of the entire group was thirty-one months after diagnosis. The incidence at this time of 31.3 per cent of failure cases in group 1 clearly demonstrates that castration does not constitute prophylaxis against the occurrence or development of metastases.

Additional data compiled on group 2 are of particular interest in evaluating this method of treatment. The 12 patients who are living and well have all survived twenty-one months or more, the longest period since operation being thirty-six months. The 10 failures in this group who are still alive enjoyed a favorable response for an average of 11.4 months. The terminal stage in delayed failure cases has been of short duration in most instances.

The average duration of life in the group of 21 who died was 11.3 months, although 7 of these survived less than nine months. The latter figures gain added significance when compared with those compiled by Bumpus, who found that when metastases had occurred at the time of examination two thirds of the patients died within nine months. An advantage of endocrine therapy is indicated by the fact that only 7 of our patients (16 per cent) having metastases which were producing pain at the time of orchiectomy failed to survive the nine months period. The survival of 84 per cent as compared to 33 per cent in the Bumpus series, at the stated interval of time, is obviously to be credited to advance in our methods of treatment.

In this series there has been no effort made to compare the efficiency of estrogenic therapy with that of castration. The relative worth of the two methods can be appraised only by a study of controlled parallel series. We are at the present time treating a series of patients with diethylstilbestrol² and will report the results observed in that group at a later date.

In the present series there were 2 patients who obtained relief of pain following castration who had previously failed to derive any benefit from the ingestion of diethylstilbestrol 3 mg. daily for several weeks. Likewise there are now 2 of the orchiectomy delayed failure patients who were relieved of their recurrent pain following administration of the estrogenic substance.

CONCLUSIONS

A second follow-up study conducted on a series of patients treated by orchiectomy for prostatic cancer gives continued evidence of the value of this form of treatment.

Forty-five per cent of the patients remain free from symptoms twenty-one to thirty-six months after orchiectomy, but 21 patients previously reported as showing favorable response have had recurrent symptoms of advanced disease and several of these are dead. The increasing incidence of delayed failure in this series suggests that eventually all cases may fall into this category.

It is evident that endocrine therapy increases the life expectancy of patients with prostatic cancer by causing a suppression of carcinogenic activity for temporary but varying periods of time; and this temporary control of the neoplasm is accompanied clinically by a period of relief from symptoms resulting from the malignant disease.

It would seem logical to conclude that the maximum benefit to the patient may be derived by delaying endocrine treatment until indicated by the onset of symptoms arising from advanced or metastatic lesions. Only in this manner can the longest period of palliative relief be assured.

THE CONSERVATIVE TREATMENT OF CHRONIC BURSITIS

BY INJECTION OF SCLEROTIC AGENTS COMBINED WITH DRAINAGE

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Chronic bursitis has long been successfully treated by injection of a chemical sclerotic agent into the endothelial sac, effecting an obliteration of the sac by adhesive fusion of its surfaces.¹ An accepted practice consists in aspiration of the sac, introduction of an irritant, withdrawal of some part of the irritant and the application of a compressive dressing. Reeffusion, if any thereafter, is aspirated as required. In the main, this method has given satisfaction.²

To reduce the number of respirations ordinarily necessary after the usual method of care, a variation in technic has been adopted which shortens treatment time and facilitates fusion.

Increase in cases is resulting from the greater number of workmen laboring in confined spaces where elbows and knees come in frequent contact with hard surfaces. Cases here reported were seen in a group of shipyard workmen.³

A variety of pathologic types of bursitis were encountered. Fifty cases of bursitis have been observed, of which 30 were olecranon bursitis, 18 prepatellar bursitis and 2 semimembranosus bursitis (Baker's cyst) in the popliteal space. Of the 30 cases of olecranon bursitis, 3 presented acute hemorrhage in the sac, 8 presented infected sacs and 19 presented chronic effusion. Of the 18 cases of prepatellar bursitis, 4 presented hemorrhage in the sac, 2 infection and 12 chronic effusion. Of the 2 cases of popliteal bursitis, 1 presented hemorrhage and the second chronic effusion.

Appropriate treatment was given patients with hemorrhage and infection. Sacs containing "rice bodies" were surgically excised.

1. Riddle, Penn.: Injection Treatment of Hernia, Hydrocele, Gyngeion, Hemorrhoids, Prostate Gland, Angioma, Varicocele, Varicose Veins, Bursae and Joints, Philadelphia, W. B. Saunders Company, 1949.
Sarma, P. J.: The Injection Treatment of Ganglions and Bursae: Indications and Limitations, S. Clin. North America 20:135-149 (Feb.) 1940.

2. Carp, Louis: The Conservative Treatment of Prepatellar Bursitis, Surg., Gynec. & Obst. 52: 87-91 (Jan.) 1931.

3. Employees of the California Shipbuilding Corporation, Ltd., Consolidated Steel Corporation, Ltd., and Western Pipe & Steel Company.

2. Diethylstilbestrol is being supplied by the Eli Lilly Company.

This article deals primarily with chronic bursitis in which effusion has been present for some time, particular consideration being given to the advantage of continuous drainage of the sac after an irritant has been introduced.

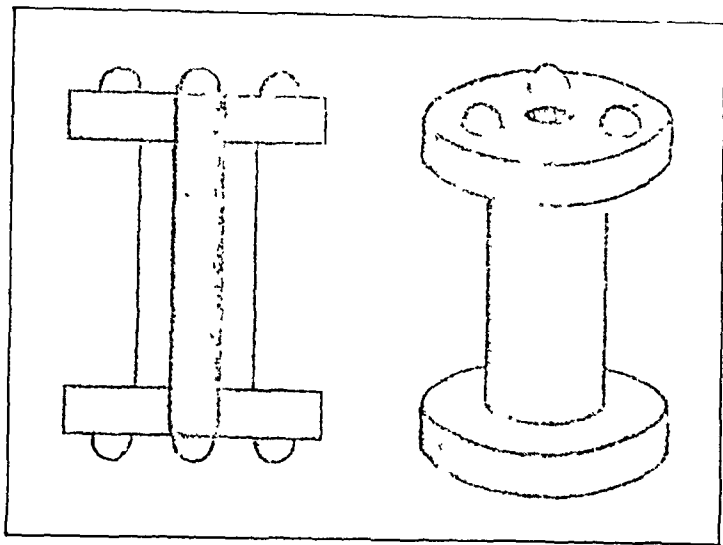


Fig. 1.—Specially designed self retaining hollow spooled bursal rubber drain, three times actual size

Initial treatment in all cases of chronic bursitis is administered in the field hospital. This consists of sterile aspiration of the sac followed by the application of a compressive dressing. When it is demonstrated that this simple treatment does not obliterate the sac, chemical obliteration is then undertaken.

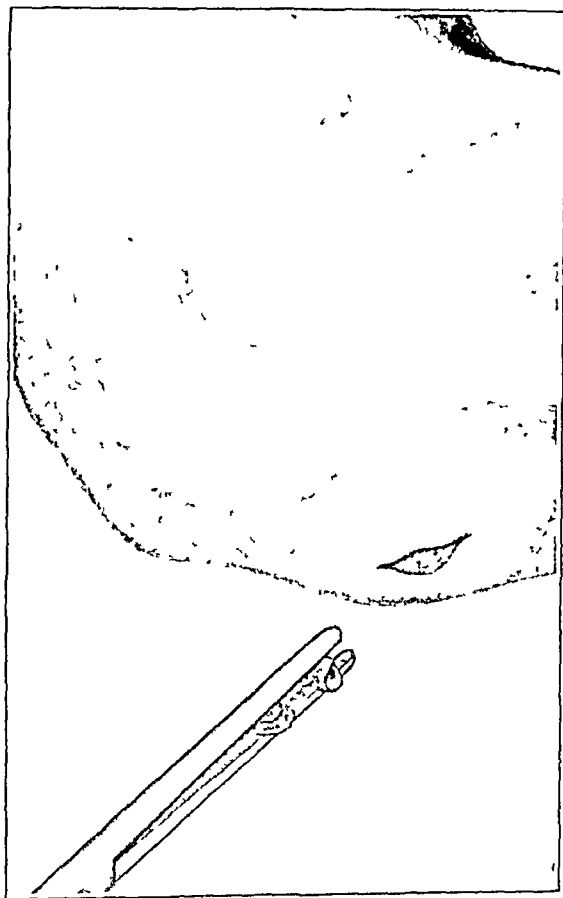


Fig. 2—Incision through procaine hydrochloride infiltrated skin over olecranon bursa. Folded rubber bursal drain ready for insertion into bursal sac

The technic employed consists in thorough cleansing the skin, which is painted with an antiseptic. Two per cent procaine hydrochloride is infiltrated intradermally over the sac. A 0.5 cm. transverse incision is then made into the sac, into which is introduced

a specially devised hollow tubed, spool shaped soft rubber drain.⁴ The contents of the sac are allowed to drain off; when empty the sac is refilled through the drain, 2 to 5 cc. of a sclerotic agent being introduced by means of a glass tip syringe inserted in the drain. The sclerotic agent is retained within the sac for five to ten minutes and then drained off. A rubber sponge pad cut out about the drain, which is covered by a fluff dressing, is held in position over the bursal sac by an elastic adhesive dressing which does not encircle the extremity. In some cases the part is further immobilized by an elastic bandage. This primary dressing is left in position twenty-four hours and then a fresh dressing is applied. The drain itself is left in situ forty-eight to ninety-six hours, at the end of which time it is

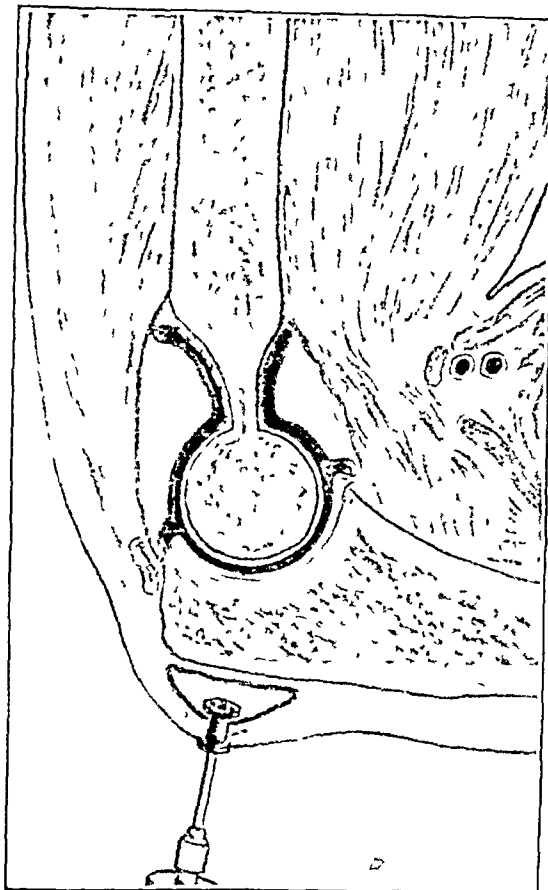


Fig. 3—Bursal drain in position. Sac distended with sclerotic agent introduced through drain. Agent left in sac five to fifteen minutes, then aspirated off

removed, the compressive dressing being continued. Reexamination after five to seven days usually demonstrates that the sac has been successfully obliterated. In subsequent weeks reeffusion has rarely been observed.

Continuous drainage of an uninfected structure may invite infection. Special consideration was given this potential complication, particularly under circumstances wherein men return to employment in dirty, dust laden environments. In no instance, however, has infection occurred, perhaps because the reactive inflammation set up by the irritant establishes an effective barrier against bacterial invasion.

Materials used for sclerosis were sodium morrhuate 5 and 10 per cent; tincture of iodine 0.5 per cent; proliferol solution and sodium psyllate 5 per cent.⁵ The latter has been found routinely satisfactory, effecting a mild type of irritation without excessive reaction.

Of 15 patients with chronic olecranon bursitis so treated, 14 have been apparently cured. One has a recurrent effusion which will require secondary treat-

⁴ Manufactured by the Kirkhull Rubber Company, Los Angeles
⁵ Sylnsol (trade name, Searle & Co.).

Summary of Results

Bursitis

Total cases, all types.....	50
Location of bursae:	
1. Olecranon.....	30
2. Prepatellar.....	18
3. Popliteal.....	2

Pathology

Olecranon:	
1. Acute hemorrhage in sac.....	3
2. Acute infection in sac.....	8
3. Chronic effusion.....	19
A. Multiple aspirations.....	1
B. Surgical excision.....	3
C. Chemical obliteration.....	15
Patellar:	
1. Acute hemorrhage in sac.....	4
2. Acute infection in sac.....	2
3. Chronic effusion.....	12
A. Surgical excision.....	1
B. Chemical obliteration.....	11
Popliteal:	
1. Hemorrhage and effusion.....	1
2. Chronic effusion.....	1
A. Chemical obliteration.....	1

Chemical Obliteration

Olecranon bursitis:	
Number of cases treated.....	15
Materials used:	
1. Synnasol.....	10
2. Proliferol.....	2
3. Sodium morrhuate.....	1
4. Dextrose.....	1
5. Tincture of iodine.....	1
Average number of visits.....	3
Duration before treatment:	
Longest.....	5 months
Shortest.....	14 days
Duration of observation after treatment:	
Longest.....	10 months
Shortest.....	1 month
Time Loss:	
1 case.....	5 days
14 cases.....	0 days
Results:	
Failure.....	1
Cure.....	14

Prepatellar bursitis:	
Number of cases treated.....	11
Materials used:	
1. Synnasol.....	5
2. Proliferol.....	3
3. Sodium morrhuate.....	3
Average number of visits.....	3
Duration before treatment:	
Longest.....	12 months
Shortest.....	2 weeks
Duration of observation after treatment:	
Longest.....	11 months
Shortest.....	1 month
Time loss:	
1 case.....	8 days
1 case.....	4 days
1 case.....	3 days
7 cases.....	0 days
Results:	
Failure.....	1
Cure.....	9

Popliteal bursitis:	
Number of cases.....	1
Material used: synnasol	
Number of visits.....	4
Period of observation.....	5 months
Time loss.....	0
Results: full recovery	

ment. The bursae had existed from fourteen days to five months prior to treatment. The period of observation after treatment has extended from one to ten months. The number of office visits required does not range over four or five. Loss of time from work has been minimal.

Eleven cases of prepatellar bursitis were treated with ten apparent cures. One recurrent bursa will require additional attention. Prepatellar bursae so treated have existed from two weeks to twelve months. The period of observation after treatment has ranged from one to eleven months. Again, frequency of visits and time off from work have been minimal.

Chemical obliteration of a popliteal bursa was effective in the case treated. Prior to injection, multiple

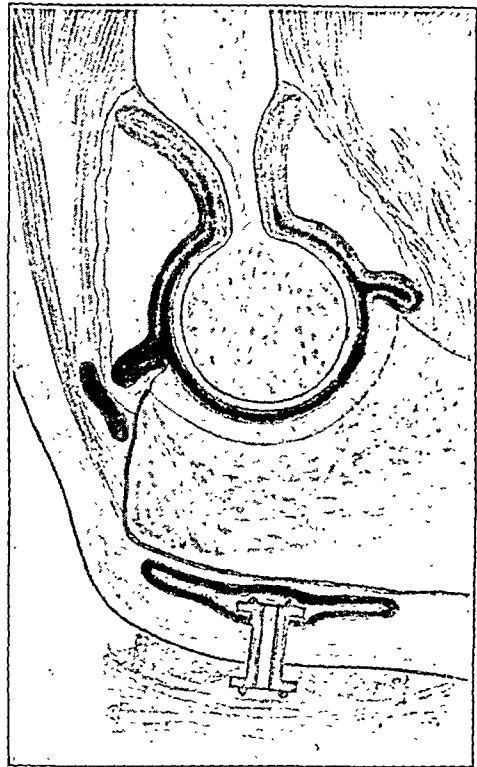


Fig. 4.—Drain in position in irritated sac; sponge rubber and gauze compressive dressing applied.

aspirations had adequately demonstrated that the bursa sac did not communicate with the knee joint, which safely permitted this type of treatment.⁶

SUMMARY

Of 50 cases of bursitis of various types involving the olecranon, prepatellar and popliteal bursae, chemical obliteration treatment was used in 27 cases presenting chronic effusion. Other appropriate methods of treatment were used in the remaining cases. In 27 cases treated by chemical obliteration in which a special type of rubber drain was used, 25 have apparently been cured. The number of required office visits is minimal and loss of time from work is short. The use of an indwelling specially devised rubber drain after injection of the irritant appears to reduce the necessity of reaspirations, shortens treatment time and results in a satisfactory number of cures.

920 Security Building.

6. Meyerding, Henry W., and Van Demark, Robert E.: Posterior Hernia of the Knee, J. A. M. A. 122: 858-861 (July 24) 1943.

ABSORPTION OF INSULIN LABELED WITH RADIOACTIVE IODINE IN HUMAN DIABETES

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Delay in absorption of insulin from subcutaneous tissues may be one of the factors that reduce the efficiency of insulin and contribute to the condition known as insulin resistance. In 3 diabetic patients with insulin resistance, studies of the respiratory quotient after ingestion of dextrose had indicated so little effect on the quotient even when insulin was given as to suggest that some specific factor might retard the absorption of insulin. When injected intravenously, insulin was more effective than when injected subcutaneously. In 1 of these patients, areas of fatty atrophy under the skin were present not only where insulin had been injected but in certain parts of the body, such as the breasts, where insulin had never been injected. Furthermore, the subcutaneous tissue in certain parts of the thighs and the abdomen of this patient seemed to have a different consistency from the tissue in other parts of the body, so that it appeared likely that the rate of absorption of injected insulin might be different in one part of the abdominal wall from that in another part. In a fourth patient with insulin resistance, the peak of resistance (when 630 units of insulin were required) had passed two years previously, and she exemplified the phase of recovery from resistance. In 3 other diabetic patients the existence of localized fat pads where insulin had been injected too frequently in one spot provided a means of showing whether such changes in tissue affect the rate of insulin absorption. These 7 patients, together with 3 ordinary diabetic patients¹ and 5 nondiabetic controls, afforded an excellent opportunity for measuring the variations in the rates of absorption of insulin after subcutaneous injection by using an insulin labeled with radioactive iodine.

Previous Studies.—The absorption rate of insulin from the site of injection has been previously studied by Beecher and Krogh,² who injected protamine zinc insulin into a rabbit's ear, using methylene blue as a tracer. Biologically active derivatives of crystalline insulin, containing iodine and arsenic, have been prepared by Lang and Reiner.³ Reiner, Keston and Green⁴ studied the absorption and the distribution in animals of an insulin derivative containing radio-

active iodine. Ten rabbits were injected subcutaneously with two thirds of a unit per kilogram. The rabbits were killed at given intervals, and the skin at the site of injection and corresponding parts of the abdominal wall were removed. Blood samples were taken for sugar determination. The tissues were then analyzed, and the amount of iodine remaining at the site of injection was quantitatively determined. They found that in these small animals the rate of removal of insulin from the site of injection was so rapid that by the end of two hours approximately 80 per cent of the insulin had been absorbed. The fall in blood sugar was greatest at a period from one and one-half to two hours after injection, earlier than is usually found in human beings. In rats one hour after intravenous or intracardiac injection the circulating blood contained a considerable fraction of the radioactive material injected. Relatively large quantities of the material were also found in the liver and the kidneys, suggesting concentration of insulin in these organs. These results provided a method by which the rate of absorption of insulin in human subjects could be measured.

Injection of Radioactive Insulin and Counting the Gamma Rays.—With three exceptions (case 7 and 2 controls), the subjects to receive the insulin com-

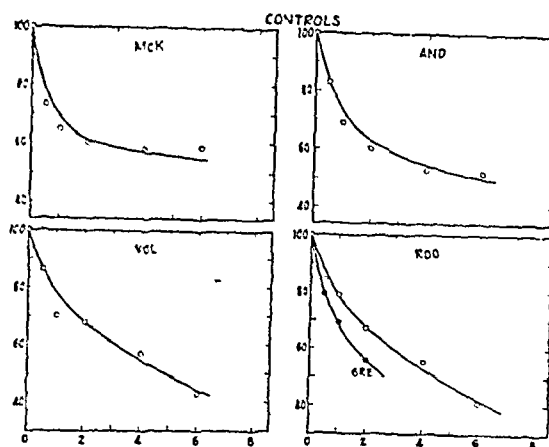


Chart 1.—Rate of insulin absorption after subcutaneous injection of 25 units of radioactive insulin-4-iodoazobenzene (normal control subjects). In chart 1 and also in charts 2 to 5 the ordinates represent the counts of the gamma rays expressed as percentages of the initial count (100 per cent) and the abscissas indicate the hours after insulin injection.

pound⁵ came to the laboratory in the morning without breakfast and also had no lunch. The site of injection was carefully marked with mercurochrome, so that the window of the gamma ray counter could be applied directly over it. A dose of 25 units of radioactive insulin-4-iodoazobenzene⁶ was injected with an ordinary hypodermic needle one-half inch in length, inserted at a slight angle so that the deposit of insulin finally occurred at somewhat less than one-half inch below the surface of the skin, exactly in the center of the ring (three fourths of an inch in diameter) on which the window of the counter rested. The injection was made in the subcutaneous tissue overlying the deltoid muscle except in cases 1, 5, 6 and 7. In case 1 the abdominal tissue was always used for injection, and in cases 5, 6 and 7 (in which there were insulin pads at the hip and in the anterior portion of the thighs) the same pad was used as the site of injection. When the injection was made, care was taken to avoid pinching of the tissue. Without any squeezing of the subcutaneous tissue the needle was inserted quickly, allowed

From the George F. Baker Clinic (Elliott P. Joslin, medical director), New England Deaconess Hospital, Boston, the Massachusetts Institute of Technology, Cambridge, Mass., the Wallace & Tiernan Products, Inc., Belleville, N. J., and the Nutrition Laboratory, Carnegie Institution of Washington, Boston.

1. A clinical summary of the diabetic patients is given in the appendix.

2. Beecher, H. K., and Krogh, A.: Microscopic Observation of the Absorption of Insulin and Protamine Insulin, *Nature* **137**: 458 (March 14) 1936.

3. Lang, E. H., and Reiner, Laszlo: Crystalline Insulin Derivatives, *Science* **93**: 401 (April 25) 1941.

4. Reiner, Laszlo; Keston, A. S., and Green, M.: The Absorption and Distribution of Insulin Labeled with Radioactive Iodine, *Science* **96**: 362-363 (Oct. 16) 1942.

5. Dr. F. B. Peck of the Eli Lilly Company provided zinc insulin crystals for preparing the product.

to remain three or four seconds and then quickly withdrawn. In the normal subjects and in most of the diabetic patients no leakage of insulin out through the needle track occurred. However, in certain of the insulin resistant patients leakage of one or two drops did occur, and this leakage was carefully blotted by

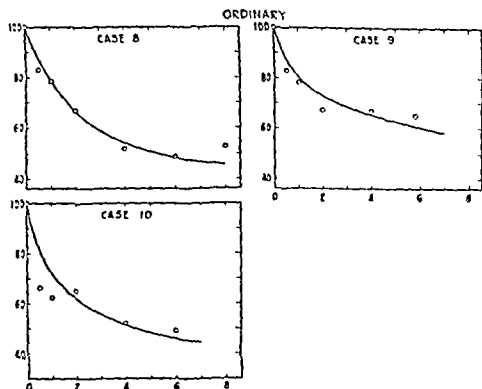


Chart 2.—Rate of insulin absorption after subcutaneous injection of 25 units of radioactive insulin-4-iodoazobenzene (ordinary diabetic patients).

means of sterile gauze. The strength of the insulin was such that an injection of 25 units meant injection of 0.5 cc. by volume. After the injection of insulin the counter was applied immediately. Thereafter the patients returned for counts at intervals of twenty minutes, one hour, two, four and eight hours, the time being carefully measured by a stopwatch in each instance according to a prearranged schedule and recorded.

RESULTS

Rate of Insulin Absorption.—In charts 1 to 5 are presented curves showing the trends of the gamma ray rates as observed with recording counting meters for each subject at each period of measurement following the injection of the radioactive insulin compound. In each chart the rates are expressed as percentages of the initial count and plotted against the time expressed in hours. For example, with the control subject McK. (chart 1) at the end of two hours a count equal to

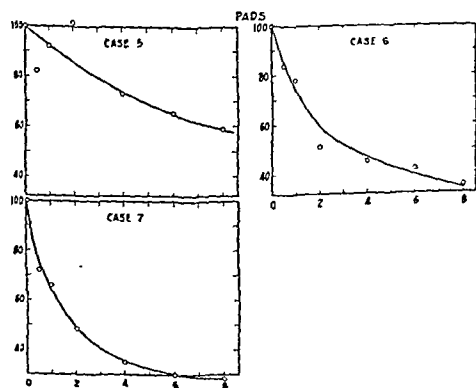


Chart 3.—Rate of insulin absorption after subcutaneous injection of 25 units of radioactive insulin-4-iodoazobenzene (patients with insulin pads). In cases 5, 6 and 7 the insulin pad had been used as the site of injection for days prior to the study.

60 per cent of the initial count was obtained, indicating the presence at the site of injection of 60 per cent of the injected insulin. One surmises that individual differences in subcutaneous tissue may have been present. With some persons the subcutaneous circulation

might tend to bring about a movement of insulin toward the surface. An explanation for some of the variation is that the actual site of injection may not have been in all instances in the center of the circle but, because of the length of the needle, off to one side. Variations in depth of insertion of the needle also will produce slight differences in count because of the absorption in tissue of emerging gamma rays. However, sufficient counts were made in each instance to give a clear picture of the rate of absorption.

The curves obtained with the normal controls (chart 1) and the ordinary diabetic patients (chart 2) are strikingly similar in nature. They indicate that the rate of insulin absorption was rapid during the first one to two hours and became progressively slower during the next four to six hours.

A striking contrast appears in the patients who had insulin pads (chart 3). Large, firm, fatty pads, seemingly fully 1 inch in depth, occurred over the head of each femur of patient 5, where she had long injected insulin because, with the development of the pad, the injections became painless. In cases 6 and 7 the fatty pad had developed similarly because of repeated injections, but for a much shorter period than in case 5. However, these pads had not been used as a site of injection for a number of days prior to our study.

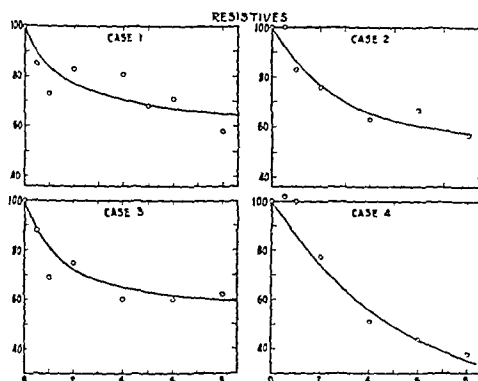


Chart 4.—Rate of insulin absorption after subcutaneous injection of 25 units of radioactive insulin-4-iodoazobenzene (insulin resistant diabetic patients). Case 4 represents a stage in recovery from insulin resistance.

This had resulted in rapid softening of the pads, and they had become much thinner, so that the insulin actually was deposited in more nearly normal tissue under the pad. Case 5 showed an extraordinary delay in insulin absorption, whereas cases 6 and 7 gave normal absorption curves (chart 3). A rapid change in rate of insulin absorption can therefore be brought about by cessation of repeated injections into an insulin pad.

Among the 4 insulin resistant patients the curves for patients 1, 2 and 3 (chart 4) show a definite delay in insulin absorption, especially during the first two hours, and in these 3 instances the delay in absorption persisted even to the eighth hour. In cases 1, 2 and 3 diabetes had existed for 20, 4 and 11 years. The diabetes had been strikingly mild for 18, 2 and 10 years respectively when the condition of insulin resistance developed. The diabetes of patient 4 was of 7.6 years' duration. She had had insulin resistance for more than seven years, but great improvement had occurred in the last two years. The decline in insulin requirement is associated with a curve (chart 4) indicating an almost normal rate of insulin absorption. Patient 1 also has shown such improve-

ment during the ten months since these studies. She has gained weight, and the subcutaneous tissue seems more nearly normal.

The differences in the average rates of absorption of insulin by the three groups control, ordinary diabetic patients and resistive patients are shown in chart 5. When the results are plotted on semilogarithmic graph paper the curves do not become straight lines but retain a curvature somewhat similar to their appearance in charts 1 to 5. This means that the rate of uptake of insulin from the site of injection does not correspond to a constant fractional absorption having a single absorption coefficient. The absolute rate and the fractional rate of absorption are both most rapid immediately after injection, and both decline steadily as the most accessible insulin is absorbed from the tissues of the injection site.

Blood Sugar.—Periodically throughout the day of the test (Nov. 29, 1942) blood sugar determinations (table 1) were made with capillary blood to show the effect of injections of insulin on blood sugar and to ascertain whether wide variations in the level of blood sugar might of themselves affect the rate of withdrawal of the injected insulin from the subcutaneous tissue. Actually it was not justifiable to give each patient 25 units of the radioactive insulin only, because the

insulin resistant patients were accustomed to receiving large amounts of insulin in the morning, and unless in such cases the 25 units of radioactive insulin had been supplemented by other insulin the blood sugar might have risen to an excessive level. Furthermore, since the diabetic patients with 1 exception received no break-

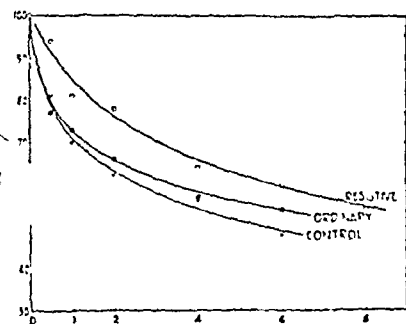


Chart 5.—Comparison of the average rates of insulin absorption of normal controls, ordinary diabetic patients and insulin resistant diabetic patients

fast, 100 cc. of orange juice was given each hour to avoid hypoglycemia. The five normal controls, of whom 2 had taken a light breakfast, received no food during the test. Four showed a decline in blood sugar consistent with the insulin dose of 25 units. And was an exception. In one control subject, Vol, hunger and sweating developed at the end of four hours, suggesting hypoglycemia. He therefore took food, with the result that the blood sugar at the end of four hours rose from 70 to 123 mg. In the 4 resistant cases, supplementary doses of one-half the usual morning doses of insulin were given, the amounts varying between 50 and 100 units. In these 4 cases (cases 1 to 4) the blood sugar values rose during the first two hours and failed to reach normal levels at six hours. The other 6 diabetic patients actually showed a decline in blood sugar during the four to six hours such that hypoglycemic reactions occurred, requiring still further additional carbohydrate in the form of orange juice. The 25 units of radioactive insulin was therefore fully as effective in reducing the blood sugar as had been anticipated. The insulin resistant cases stand out in distinct contrast to all the other cases.

If patients 5 and 6 are compared (patient 7 had taken breakfast), it is seen that insulin pads affect the blood sugar curves. Patient 5 usually received 10 units of crystalline and 30 units of protamine zinc insulin; patient 6, 13 and 44 units, respec-

tively. The 25 units of radioactive insulin was therefore a relatively larger dose for patient 5 than for patient 6, especially in view of the omission of breakfast and lunch. At the end of one hour the blood sugar of patient 5 had fallen only 23 mg., but that of patient 6 had fallen 143 mg. The rates of decline were almost the same in the second hour, but in the fourth and sixth hours patient 5 showed a decline to a hypoglycemic level. The maximum fall in blood sugar was 183 mg. for patient 5 and 190 mg. for patient 6. When the difference in weight of these patients (patient 5 weighed 96 pounds, or 43.5 Kg., and patient 6 112 pounds, or 51 Kg.) and therefore the difference in the total dextrose content of the body fluids are considered, it is evident that insulin probably caused oxidation or storage of a much larger quantity of dextrose in patient 6 than in patient 5.

Patients 8, 9 and 10 were young persons with uncomplicated diabetes under good dietary control. Under such conditions the 25 units of insulin, with orange juice each hour, prevented wide variations in blood sugar, although each patient complained of hypoglycemic symptoms in the third to fifth hours and received extra orange juice. The average maximum fall in blood sugar at four hours was 19 mg. for the normal controls (without breakfast) and 44 mg. for these 3 diabetic patients, an evidence of the ability of the nondiabetic organism to withstand the effect of added insulin. Although the rate of insulin absorption was approximately the same, the fall in blood sugar and the development of hypoglycemic symptoms in the diabetic patients, in spite of their receiving orange juice each hour, showed a susceptibility to hypoglycemia not exhibited by the normal subjects, of whom only Vol received food after the injection.

The hypothesis that hyperglycemia might accelerate and hypoglycemia delay insulin absorption from the site of injection is not supported by the data. It is likely, therefore, that local tissue conditions affect the rate of withdrawal of injected insulin rather than the level of the blood sugar. As the level of the blood sugar must be regarded as correlated not only with the level of sugar in the intercellular fluid but also with the dextrose concentration and the dextrose metabolism in the cells, it is also probable that the rate of insulin absorption is not conditioned solely by the state of intracellular dextrose metabolism.

Measurement of Radioactive Substance in Twenty-Four Hour Urinary Excretion.—Although no methods were available by which we could quantitate the excretion of insulin into the urine, it was felt desirable that a measurement should be made of the radioactive substance found in the urine excreted during the twenty-four hours following the injection. In all probability the amount of radioactive substance found in the urine represented the amount of iodine present in some organic combination. It is impossible to conclude, however, that the iodine excreted in the urine was still in combination with insulin, and therefore it is impossible to infer anything with regard to the excretion of the insulin injected. The results of the measurements are shown in table 2, in which the amount of radioactive substance found in the urine is expressed as a percentage of the total radioactive substance injected. In general, the lower values for the excretion of radioactive iodine are found in the 4 resistant patients, although patient 2 excreted 74 per cent. Among the patients with pads, the one who had the greatest delay in absorption, patient 5, excreted 66 per cent.

FACTORS INFLUENCING INSULIN ABSORPTION

The molecule of the insulin compound employed is somewhat larger than the unimixed insulin molecule. Possibly this larger molecule would be less rapidly absorbed than ordinary insulin. Furthermore, the ratio of the insulin dose to body weight is significant.

TABLE 1.—Blood Sugar Before and After Injection of Radioactive Insulin-4-Iodoazobenzene

(Values in Milligrams per Hundred Cubic Centimeters)

Case No.	Complications	Before Injection (Without Breakfast)	After Injection				
			1/2 Hr	1 Hr	2 Hrs	4 Hrs	6 Hrs.
Diabetic Persons							
1	Resistive	266	266	08	288	266	207
2	Resistive	228	246	291	302	282	231
3	Resistive	164	200	191	210	205	160
4	Resistive, recovering	246	263	247	228	191	166
5	Pad	228	216	203	166	45	56
6	Pad, recovering	260	152	117	85	82	70
7	Pad, recovering	186*	222	237	222	79	56
8	None (ordinary)	140	152	154	138	65	87
9	None (ordinary)	110	103	138	135	102	79
10	None (ordinary)	93	93	76	87	62	308†
Normal Controls							
McK		97	87	87	85	82	
And		79	82	82	82	76	
Vol		100	97	82	70	12 §	
Gre		105*	103	86	79		
Roos		111*	103	103	79	76	

* Had breakfast before blood test.

† Received lunch 30 minutes before this blood test

§ Took food before this blood test, because hunger and sweating had developed

Although Reiner, Keston and Green⁴ gave their rabbits two thirds of a unit per kilogram, in our study the insulin dose of 25 units amounted to between one third and one half of a unit per kilogram. It is also true that insulin is less rapidly absorbed in human subjects than in small animals. Reiner, Lang, Irvine, Peacock and Evans⁶ have shown with rabbits that only 22 per cent of injected crystalline insulin remained at the end of five hours. Globin zinc insulin was more slowly absorbed, but protamine zinc insulin was most gradually removed, so that 60 per cent of the protamine zinc insulin remained at the site of injection at the end of ten hours. Regardless of the differences between animals and human subjects, however, the object of our study was to use a constant dose of the compound in a group of patients and a group of normal controls to determine whether there were significant differences in the rates of absorption among the different individuals.

The normal controls and the ordinary diabetic patients showed an almost equal rate of insulin absorption, and their curves are well within the range of physiologic variation. The patients with insulin resistance and insulin pads showed interesting differences. Slow absorption of insulin from the site of injection occurred in 3 patients with insulin resistance and in 1 patient whose insulin dose was injected certainly into the middle of an insulin pad. Patient 4, formerly

requiring 630 units, had so improved that she took only 120 units a day. This fact seems to correlate well with her nearly normal curve. Insulin injected into an insulin pad may be slowly liberated. This may explain the well known clinical observation that patients who use such insulin pads do lose in the efficiency of insulin and may require a correspondingly higher dose.

The cases with insulin resistance require more detailed consideration. An abnormal metabolic rate might be supposed to influence absorption of injected insulin. In the 4 cases of insulin resistance the basal metabolic rate had been found to be within normal limits on a number of occasions (see appendix). Certainly in none was there any suggestion of a lower basal metabolic rate which could influence the rate of absorption. The general circulation, as indicated by cardiac size, blood pressure and the absence of edema, gave no explanation for the delay in absorption. It might be supposed that in these persons some peculiar sensitiveness to injected insulin could produce local thrombosis of vessels, with impairment in absorption. If this was the case, no evidence in the form of localized swelling or redness was apparent.

The state of allergy to insulin is well known to be associated with insulin resistance. At the New England Deaconess Hospital⁷ a small number of patients have been observed who developed simultaneously a high degree of insulin resistance and an allergic state characterized by the appearance of general urticaria, when insulin was given. This condition has always occurred in patients who have previously taken insulin but then have stopped it for some months. On resumption of the use of insulin, the state of allergy to insulin was apparent. In certain cases, study of the blood serum has shown the presence of a large amount of specific insulin antibodies. In case 1, urticaria had at one time followed insulin injection. The blood serum of patient 4 did show specific insulin antibodies in large amount, and a persistent eosinophilia usually exceeding 20 per cent occurred. At this time (in 1936) she required 630 units daily. In 2 of 4 insulin resistant patients, therefore, either urticarial or other allergic manifestations had been present in the past. The dura-

TABLE 2.—Radioactive Substance in Urine Excreted During Twenty-Four Hours Following Injection of Radioactive Insulin

Case No.	Type	Urine Excreted in 24 Hours, Cc.	Radioactive Substance in Urine, %
1	Resistive	1,319	72
2	Resistive	1,484	74
3	Resistive	1,358	47
4	Resistive, recovering	651	46
5	Pad	1,32	6
6	Pad, recovering	1,674	17
7	Pad, recovering	2,072	50
9	Ordinary diabetic	1,249	65
McK	Nondiabetic	912	68
And	Nondiabetic	625	70

tion of insulin treatment prior to the development of insulin resistance was usually less than two years. Persistence in the use of large doses of insulin has always resulted in a reduction in the insulin requirement, and, as illustrated by case 4, seems to be paralleled by an improvement in the rate of absorption of injected insulin.

6 Complete details for the preparation of this compound have already been published (Reiner, Laszlo, Lang, E. H. Irvine, I. W. Jr., Peacock, W., and Evans, R. D. The Absorption Rates of Insulin, Globin Insulin and Protamine Zinc Insulin Labeled with Radioactive Iodine, *J. Pharmacol. & Exper. Therap.* 78: 352-357 (Aug.) 1943). Two additional refinements were introduced for this preparation. Before the protamine was diazotized, it was acidified and treated with a small amount of dilute sodium nitrite solution. The liberated iodine was then extracted with chloroform. After coupling and purifying were carried out as described in the paper mentioned, the insulin 4 iodoazobenzene solution was filtered through a small Berkefeld filter into a sterile vial, which was then closed with a sterile rubber cap. Analysis of the product showed that 10 per cent of the radioactive iodine was coupled with the insulin. This corresponds to 0.13 microgram of iodine per unit or 0.85 atom per molecule of insulin.

7 Joslin, E. P., Root, H. F., White, Priscilla, and Marble, Alex. *The Treatment of Diabetes Mellitus*, ed. 7, Philadelphia, Lea & Febiger, 1940, p. 410.

CHANGES IN DIABETIC TISSUES ASSOCIATED
WITH INSULIN ADMINISTRATION

The subcutaneous structural changes following repeated injections of insulin previously studied have included areas of inflammation, lipomatosis, increased fibrosis and areas of fatty atrophy. The first report on such structural changes, by Depisch⁸ in 1926, has been followed by numerous careful studies. In 20 per cent of the patients with atrophies studied by Marble and Smith,⁹ areas of induration were likewise found. Areas of lipomatosis have been described by Rowe and Garrison.¹⁰ It is probably true, however, that many of the tumefactions consist of masses of fibrous tissue in response to the repeated trauma of insulin injections. The finding of low grade inflammatory reactions is discussed by Marble and Smith, and reference to the literature on this subject may be found in their article. Areas of fatty atrophy, shown as depressions, particularly in the thighs or in the subcutaneous tissues of the arms where insulin has been given, are common occurrences. In certain instances areas of atrophy have occurred in regions where no insulin has been given, notably in the breasts, as in case 1 of this series. In the study of such patients reported from the New England Deaconess Hospital by Marble and Smith,⁹ tissues excised from areas of atrophy in 4 patients were subjected to microscopic examination and, in addition, analyses were made of the subcutaneous fat in diabetic and normal rats. In both the rats and the patients the striking change noted was the loss of fat, chiefly neutral fat. The histologic study bore out the impression that the process consisted in the simple disappearance of stored fat, as by lipolysis, without evidence of an inflammatory reaction.

The presence in human subcutaneous fat of a lipase that may split tributyrin and, to a lesser extent, triolein has been demonstrated, and the effect of insulin on this lipase under various conditions is being studied by Marble and Smith. The conjecture has been made, but never confirmed, that in the immediate neighborhood of injected insulin a highly increased rate of dextrose combustion takes place and that an increased destruction of fat follows. Actually, in general, the patients who develop fatty atrophy when using insulin are often those who take small doses of insulin, and there is no general tendency toward the development of insulin resistance in patients who show fatty atrophy.

Fatty atrophy in the subcutaneous tissues, therefore, does not afford a profitable comparison to explain the change in rate of insulin absorption observed in the patients of our series, although the supposition may reasonably be entertained that in some of our cases the long continued injections of insulin might have provoked some disappearance of fat and relative increase in the fibrous stroma in the subcutaneous tissues resembling that seen in areas of insulin atrophy.

Patients with insulin resistance frequently have gone through periods of relatively mild diabetes varying in length from months to twenty years, and then in a

few months (see case 1 in appendix) they have developed insulin resistance. The clinical importance of insulin resistance is that it may develop rapidly in patients whose diabetes has long been mild and the insulin dose only moderate. The physician may fail to recognize the necessity for massive doses of insulin. The patient's death in coma may be erroneously ascribed to insulin failure, when actually the cause was the administration of insufficient insulin.

The changes in local tissue associated with the formation of the insulin pad can disappear rapidly. In cases 6 and 7, in which the insulin pads were rapidly disappearing, the rate of insulin absorption was actually a little better than that of the nondiabetic normal subjects. This raises the question whether the rate of absorption of insulin may be influenced by the need of the tissues for insulin. It is conceivable that in the patient with moderately severe diabetes a condition of "insulin hunger" exists, in contrast to the condition of the nondiabetic subject who has a normal supply of insulin from his own pancreas. Therefore the rate of absorption of injected insulin might well be slower in normal than in diabetic tissue. Possibly this explains the fact that in the ordinary diabetic patients and in the 2 patients who were recovering from the formation of insulin pads the rate of absorption of insulin was apparently equal to or even a little better than that of the nondiabetic controls, particularly if the values at the six hour period are compared. The average amount of radioactivity remaining at the end of six hours was 48 per cent in the 5 normal controls, whereas it was only 36 per cent in the 2 patients recovering from the formation of insulin pads. On the day of the test the insulin was injected into these 2 persons through areas of pad formation that had previously been deliberately avoided for ten days or more in the administration of insulin. Therefore, not only had the pad rapidly subsided in these patients but there had been no local trauma or irritation from insulin for a long period. It is common knowledge that diabetic patients who systematically practice giving insulin injections according to a map may avoid injecting insulin into the same area for ten days or even a month. Such patients rarely have any local evidences of trauma from insulin, and it is usually thought that they get better absorption of insulin. These data afford clear proof of the importance of planning insulin injections on a definite schedule, so that the same site of injection will not be used more than once in two weeks.

Extraordinary differences in the rate of absorption of injected insulin can be demonstrated in different diabetic patients. We cannot conclude that the phenomenon of insulin resistance is entirely explained by these variations in local tissue absorption. Other recognized causes for insulin resistance include (1) hyperactivity of the insulin antagonists, namely the pituitary and the adrenals, (2) disturbances in liver function, (3) infection, (4) excessive destruction of the insulin producing apparatus, as in carcinoma of the pancreas, (5) allergic states, particularly with widespread disturbance in the carbohydrate storage of the skin and the production of specific insulin antibodies, (6) hypermetabolism associated with hyperthyroidism, and (7) acidosis. Nevertheless, in patients who have insulin resistance requiring large doses of insulin, remarkable changes in the rate of absorption of insulin do some-

8. Depisch, F.: Über lokale Lipodystrophie bei lange Zeit mit Insulin behandelten Fällen von Diabetes, *Klin. Wchnschr.* 5: 1965-1966 (Oct. 15) 1926.

9. Marble, Alexander, and Smith, R. M.: Atrophy of Subcutaneous Fat Following Injections of Insulin, *Proc. Am. Diabetes Assoc.* 2: 173 (June) 1942.

10. Rowe, A. H., and Garrison, O. H.: Lipodystrophy; Atrophy and Tumefaction of Subcutaneous Tissue Due to Insulin Injections, *J. A. M. A.* 99: 16-18 (July 2) 1932.

times occur. The cause seems to be some metabolic or structural change in the tissues that receive the injections, but this change may also be present in other tissues such as the liver or muscles, to which insulin is conveyed by the blood. This investigation suggests

TABLE 3.—Clinical Summary of Ten Diabetic Patients Receiving Radioactive Insulin-4-Iodoazobenzene

Case No.	Age, Years	Sex	Duration of Diabetes, Years	Body Weight, Pounds	Maximum Insulin Dose, Units	Present Daily Insulin Dose, Units		Usual Daily Diet			Complications
						Crystalline	Protamine Zinc	Carbohydrate, Gm.	Protein, Gm.	Fat, Gm.	
1	62	♀	20	118	2,100	650	...	170	100	90	Resistive
2	49	♂	4	109	190	70	100	150	90	100	Resistive
3	55	♂	11	137	372	160	...	182	82	93	Resistive
4	42	♀	7	124	630	120	...	180	80	125	Resistive, recovering
5	36	♀	2	96	54	10	30	164	90	106	Pad
6	17	♂	3	112	90	13	44	160	70	80	Pad, recovering
7	46	♂	5	167	35	...	35	175	94	111	Pad, recovering
8	23	♀	2	120	60	10	44	180	100	120	None (ordinary)
9	31	♂	0	146	60	20	24	178	91	110	None (ordinary)
10	29	♂	14	135	72	10	50	178	91	110	None (ordinary)

the practicability of using some radioactive substance with human subjects in studying the absorption of other drugs injected subcutaneously, about which little is known at the present time.

SUMMARY

1. The rate of absorption of 25 units of insulin-4-iodoazobenzene (one-third to one-half unit per kilogram) labeled with radioactive iodine and injected subcutaneously was measured for eight hours in 10 diabetic patients and 5 normal controls.

2. In the normal controls and the patients with uncomplicated diabetes, insulin absorption took place at an almost equal rate, which was rapid during the first two hours but became progressively slower.

3. Areas of induration or of pad formation caused pronounced retardation of insulin absorption. Yet, when such insulin pads had rapidly disappeared because of cessation of injection in the area, the tissues regained the power of rapid absorption of insulin.

4. Patients with idiopathic insulin resistance showed significant delay in insulin absorption. In such cases insulin produced a more definite effect on blood sugar and respiratory quotient when injected intravenously than when injected subcutaneously. During recovery from insulin resistance, the rate of absorption became normal.

5. In the normal controls and in all the diabetic patients except those with insulin resistance, the blood sugar declined after insulin injection. In the resistant patients, the blood sugar rose during the first two hours and had not reached normal levels at the sixth hour. Wide variations in the initial level of blood sugar did not of themselves affect the rate of insulin absorption.

6. The cause of delayed insulin absorption is not related to long duration of diabetes but is resident in the tissues at the site of injection and tends to be corrected by the continued use of insulin in amounts large enough to control glycosuria and hyperglycemia.

7. A comparison of the rates of insulin absorption from the standpoint of differences in the structure of

the tissues used for injection, with particular reference to the disappearance of insulin pads and of areas of fatty atrophy, suggests the hypothesis that in cases of insulin resistance which is associated with pronounced delay in insulin absorption, the metabolic or structural changes in diabetic tissues take place under the influence of some factor such as a disturbance in hormonal and enzyme relationships.

APPENDIX

In table 3 are summarized the clinical data, including the usual diets and insulin dosage, of the 10 diabetic patients used in our study. They are classified under four headings: (1) insulin resistant patients (1 to 4), (2) a patient (5) with thick insulin pads 3 to 4 inches in diameter and fully 1 inch in depth, apparently fatty or fibrous in structure, (3) 2 patients (6 and 7) with areas of thin insulin pads typical of recovery from the effect of repeated insulin injection at the same site, and (4) 3 diabetic patients (8 to 10) of ordinary type without evidence of insulin resistance or changes in the subcutaneous tissue.

With all 4 of the insulin resistant patients, detailed metabolic studies were made, including measurements of the respiratory quotient and the gaseous exchange both under basal, postabsorptive conditions and after the administration of dextrose with and without ordinary crystalline insulin. In 3, insulin given subcutaneously had slight effect on the metabolism unless given in massive doses. Patient 4 showed that partial recovery from insulin resistance had occurred, and improvement in the response to insulin was found.

TABLE 4.—Effects on the Respiratory Exchange of Insulin Given Subcutaneously and Intravenously in Case 1

Date and Period of Test	Time, A. M.	R. Q.	O ₂ per Min., Cc.	B. M. R., %
Sept. 1, 1942				
1	8:45	0.763	180	
2	8:55	0.756	188	
3	9:05	0.760	185	
Average	....	0.762	185	+7.2
9:17-9:18, 50 Gm. dextrose by mouth				
9:18, 400 units insulin subcutaneously				
4	10:15	0.768	204	
5	10:30	0.745	202	
6	10:45	0.745	198	
7	11:00	0.758	200	
8	11:15	0.756	211	
Sept. 10, 1942				
1	9:15	0.759	177	
2	9:25	0.788	171	
3	9:35	0.782	175	
Average	....	0.776	175	+2.3
10:01-10:02, 50 Gm. dextrose by mouth				
10:05, 200 units insulin intravenously				
4	11:00	0.756	197	
5	11:15	0.773	193	
6	11:30	0.796	206	
7	11:45	0.811	194	

The contrast between the effects of insulin given subcutaneously and by vein is shown for patient 1 in table 4. With this patient, after 400 units of insulin given subcutaneously and 50 Gm. of dextrose by mouth, no appreciable rise in the respiratory quotient was observed. However, after 200 units of insulin intravenously and 50 Gm. of dextrose by mouth, a slight

but significant rise in the quotient was observed. In all probability variations in structure occurred in different portions of the tissues used for insulin injection. On palpation, the subcutaneous tissue of this patient's abdomen felt distinctly inelastic, thickened, firm and rather fibrous. The same was true in certain portions of the thighs. Nevertheless there were certain areas where the tissue felt much more nearly normal. Indeed, on one occasion, when 300 units of insulin was given subcutaneously in another area and 50 Gm. of dextrose by mouth, a rise in respiratory quotient was obtained.

Clinical and x-ray studies of the pituitary of this patient were negative. Dr. Francis Lowell found in her blood some anti-insulin substances in low concentration. An attempt to use human insulin, on the basis that her resistance to insulin might be due to

TABLE 5.—*Effects on Respiratory Exchange and Blood Sugar of Insulin Given Subcutaneously and Intravenously in Case 2*

Date and Period of Test	Time, A. M.	R. Q.	O ₂ per Min., Cc.	B. M. R., %	Blood Sugar, Mr.
Nov. 23, 1940					
1	8:35	0.686	229		
2	8:45	0.707	224		
3	8:55	0.715	222		
Average	....	0.703	225	+7.2	320
	9:00, 100 units insulin subcutaneously				
	9:19-9:43, 50 Gm. dextrose intravenously				
4	10:05	0.692	226		
5	10:20	0.701	226		
6	10:35	0.723	218		
7	10:50	0.755	217		
8	11:05	0.675	237		
	11:23	.....	...	.....	350
Nov. 26, 1940					
	8:34	.....	...	.....	270
	8:35, 150 units insulin intravenously				
1	9:00	0.729	227		
2	9:10	0.753	230		
3	9:20	0.778	227		
Average	....	0.753	228	+6.7	
	9:32-10:02, 50 Gm. dextrose intravenously				
4	10:15	0.833	233		
5	10:30	0.833	227		
6	10:45	0.835	227		
7	11:00	0.820	231		
8	11:15	0.803	230		
	11:30	.....	...	.....	130

a species effect, was unsuccessful. Her diabetes had been mild for eighteen years, when insulin treatment was begun in February 1940. Then she required only 30 units daily. The phase of insulin resistance appeared in November 1941. Her insulin requirement gradually increased until in the period from December 1941 to August 1942 she took from 1,400 to 2,100 units daily. The dose had been reduced during the intervening weeks to 650 units daily.

In case 2 the effects of 50 Gm. of dextrose given intravenously on two different occasions are compared, first, when 100 units of crystalline insulin was given subcutaneously and, second, when 150 units was given intravenously. Only a slight rise in respiratory quotient (table 5) and no decline in blood sugar followed the subcutaneous injection, whereas with the intravenous injection a rapid rise in respiratory quotient and a fall in blood sugar occurred. The difference in results is too great to be explained by the difference in insulin dosage.

CESAREAN SECTION UNDER CONTINUOUS CAUDAL ANALGESIA

A PRELIMINARY REPORT

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AND

JOHN C. ULLERY, M.D.

PHILADELPHIA

We recognize and accept the fact that the introduction of any new drug or method of treatment is usually followed by repercussions from many sources. This is particularly true if the public is informed prematurely. Unfortunately, this has happened with the introduction of continuous caudal analgesia by Drs. Hingson and Edwards¹ of the United States Public Health Service. It is not our purpose to discuss the history, use or dangers of caudal block or to compare the various methods of technic, but to endorse this new procedure as the nearest thing to safe and painless childbirth that we have in our obstetric armamentarium. After reading a report of 10,000 cases of childbirth compiled by Hingson and Edwards, and from our personal observation in 950 deliveries by this technic, we agree with the originators of this method and with other writers that it is a procedure which should be used only in a well staffed obstetric service by competent specially trained individuals. We feel sure that continuous caudal analgesia will have a definite place among the analgesic agents used in obstetric practice.

The staff of the Philadelphia Lying-in Hospital considers it a distinct pleasure to have been of assistance to Hingson and Edwards in the development of this method. We attribute the high percentage of our successful cases to the fact that the originators have been with us during most of the trial period and we have had the benefit of their advice in handling these patients.

Realizing that any new procedure has to be tried slowly and carefully, we have endeavored to surround our patients with every possible safeguard, and now after a year's experience without any maternal or fetal death attributed to its use we feel we are in a position to give continuous caudal analgesia our endorsement.

When cesarean section is indicated, three things are of paramount importance: first, the time to do the operation; second, the type of operation to be performed; and, third, the anesthetic agent to be used.

The ill effects of various drugs and inhalation anesthesia on the unborn child have long been recognized. Because of the dangers associated with one dose spinal anesthesia for cesarean section, this method was discontinued in all but a few clinics and for some years a local anesthetic agent has been looked on as the safest for mother and child. Our experience with local anesthesia for cesarean section has been most satisfactory, but not every patient is suitable for this type of anesthesia, and not all surgeons have the necessary tranquillity to use it. The introduction of continuous or fractional spinal anesthesia by Lemmon and the use of smaller doses of less toxic drugs brought about a revival of this type of anesthetic in our section cases and for the past two and a half years we have used a general anesthetic only occasionally. Our results from one dose caudal analgesia were not particularly gratifying.

1. Hingson, Robert A., and Edwards, Waldo B.: Continuous Caudal Analgesia in Obstetrics, J. A. M. A. 121: 225-229 (Jan. 23) 1943.

although Lahmann and Mietus² report satisfactory results in all but 3 of 48 cases. In 2 of the cases the caudal block wore off before the operation was completed and the closure of the abdomen was completed after pentothal sodium was administered intravenously. In another instance analgesia resulted, but the anesthesia on the anterior abdominal wall failed to rise sufficiently high to permit an adequate incision. This patient's block was complemented by nitrous oxide anesthesia. They reported no maternal deaths, and the three fetal deaths could not be attributed to the technic or type of anesthetic. They, as all writers on this subject, call attention to the necessity of having the patient surrounded by safety measures and conclude that caudal anesthesia is well suited for cesarean section. After observing the results of continuous caudal anesthesia in several hundred vaginal deliveries, we extended its use for immediate puerperal sterilization. Our results were satisfactory. Following this we have attempted to evaluate its use for cesarean section and herewith is a report on our observation in 50 cases. Twenty-nine of the patients were operated on at the Philadelphia Lying-in Hospital, 3 at the Jefferson Medical College Hospital and 2 at the Philadelphia General Hospital. We are indebted for the addition of 12 cases managed by Hingson and Edwards at the Marine Hospital, Staten Island, and the report of 4 patients operated on by Dr. John C. Hirst at the Preston Retreat, to be included in this series.

In our series the indications for operation were as shown in table 1.

Mental reassurance should be included in the usual preoperative preparation of a patient who is going to be conscious during a surgical procedure. The type of anesthesia to be used is never discussed until the patient has been hospitalized, when the operation is elective; that is, the decision to perform cesarean section is made prior to the onset of labor because of clearcut indications. If the anesthesia is discussed previous to admission, the patient is sure to discuss it with a friend, who supposedly has heard of a patient whose anesthetic wore off before the operation was completed or who died from the use of a spinal injection. It will take some time to educate the public to the value of continuous spinal and caudal methods of anesthesia, and although we have had no patient who has absolutely refused it, several have been very doubtful about taking it. An interesting point is that each of the patients who protested mildly against its use were most enthusiastic on completion of the operation. For example, one patient who had had a previous cesarean section under gas-ether sequence told us that the day after her second cesarean section, which was under continuous caudal anesthesia, she felt as good as she did on the fifth day after her first operation.

In addition to the mental preparation of the patient it is advisable to prepare the family for the length of time the patient is required to remain in the operating theater. It is essential that the operation not be started until the anesthesia is complete; and, in order that the family may not be unduly worried, it should be acquainted with this necessary delay.

Quiet in the operating room is most important, as the dropping of instruments and pans, or loud talking, disturbs the patient. An indispensable part of the operating team is the anesthetist, who remains at the head of the table and reassures the patient while carrying on a low toned conversation with her at least until the

baby is delivered. All fear usually leaves the patient immediately after she hears the baby cry, and the operation is completed in an entirely different atmosphere.

The contraindications for using continuous caudal analgesia are:

1. Gross deformities of the spine, particularly of the sacrum.
2. Tumors which narrow the spinal canal.
3. Local infection around the sacral hiatus
4. Skin infections such as boils or carbuncles anywhere on the body (a contraindication to be evaluated by the physician in charge).
5. History of sensitivity to the analgesic agent.
6. Profound anemia, unless supplemented with oxygen inhalation.

We have hesitated to use this technic in cases of placenta previa because of the relaxation of the cervix and the possibility of bleeding. This is particularly true if the patient has had any uterine contractions.

In addition, caudal analgesia is seldom satisfactory in hysterical patients, and some women do not like it because their fear of childbirth is such that they dread being conscious during the process.

TABLE 1—Indications for Operation

Disproportion, twin pregnancy, toxemia	1
Disproportion, preeclamptic toxemia	1
Disproportion, previous section	3
Disproportion, pulmonary tuberculosis	1
Disproportion (cephalopelvic)	21
Diabetes	2
Eclampsia	1
Preeclampsia	2
Multiple uterine fibroids	3
Previous hysterotomy	1
Rheumatic heart disease	1
Heart disease	6
Previous difficult delivery	2
Uterine inertia	1
Epilepsy	1
Severe contractile burn scar of perineum	1
Advanced pulmonary tuberculosis	2

Adequate fluids should be administered preceding the operation, especially in hot weather. One of the barbiturates should be given the previous night and 1½ grains (0.1 Gm.) should be given one hour before operation. Fifty mg. of ephedrine hydrochloride should be given intramuscularly or in the initial solution if the patient's blood pressure is below 140 mm. systolic. In hypertensive cases the ephedrine should be withheld unless the blood pressure falls to 100 mm. systolic.

TECHNIC

The technic of administering the caudal analgesia in cesarean sections is outlined as follows:

1. The patient is given 1½ grains (0.1 Gm.) of a barbiturate one hour before operation, having been given sedation the previous night.

2. One and five-tenths per cent metycaine in 125 cc. of isotonic solution of sodium chloride or isotonic solution of three chlorides is prepared and 50 mg. ephedrine hydrochloride is given intramuscularly at the time of the first injection.

3. The continuous caudal needle is inserted and the apparatus adjusted as for obstetric analgesia.

4. An initial test dose of 8 cc. is administered with careful check by aspiration to prove that the needle is not within the subarachnoid space or a blood vessel.

5. A supplementary dose of 40 to 60 cc., depending on the size of the patient, is then administered. The patient is then placed on her back and the level of analgesia is tested in twenty minutes.

2. Lahmann, Albert H., and Mietus, A. C. Caudal Anesthesia for Cesarean Section, *Am. J. Obst. & Gynec.* 46: 274-278 (Aug.) 1943.

6. If the level of analgesia has not gone above the umbilicus on both sides, a supplementary third injection of 20 to 40 cc., according to the need of the patient, is administered.

7. When the level of analgesia is complete on both sides to the height of the eighth dorsal segment, the operation may be begun. This is usually about thirty minutes after the first injection. In debilitated patients seriously ill with tuberculosis or heart disease, the procedure should be instituted forty-five minutes to one hour before operation and the level of analgesia developed more slowly.

The time required for the analgesic agent to work satisfactorily varies and, if one is to use this method, the operation should never be started before the level of analgesia is correct and repeated injections should not be given with the idea of shortening the length of time before the operation is started. In our series the minimum time before starting the operation was ten minutes, the maximum time one hour twenty minutes and the average time, thirty-four minutes.

In all of our cases but 1 we have used the malleable needle. In the 1 case the ureteral catheter technic was carried out. Since the development of this new malleable needle we have not feared breakage and have had no such accident occur.

There have been several reports of excessive drop in blood pressure when caudal analgesia is used. The average drop in our series, with the exception of 2 patients, was 26 mm. The only patient who had a severe drop of blood pressure was having her second cesarean section. The first cesarean was done four years previously, at which time she had a circulatory collapse at the onset of the operation, which was being done under nitrous oxide-oxygen anesthesia. This patient was an unstable individual with definite glandular imbalance and pronounced instability of her nervous system. She was extremely apprehensive, and because of the circumstances occurring at the time of her first cesarean section we thought that the use of the caudal technic would prevent a recurrence. Identically the same thing happened, however, after we had given only 30 cc. of metycaine, in spite of the fact that she had been given ephedrine. Plasma and other stimulants were ready and were given. The operation was continued in spite of the fact that her blood pressure had not become stabilized. It has been our experience that immediately after the delivery of the child the blood pressure regains its normal level. This has been found to be true in practically every case, and in this instance there was an immediate rise of 60 mm. of pressure within a minute after the child was removed from the uterus. We have not been able to explain this phenomenon to our own satisfaction, but it is an important observation and should be remembered when there is fear of proceeding with the operation because of an unusual drop in blood pressure. None of our cases showed any postoperative blood pressure abnormality.

Recovery of all our patients has been extremely satisfactory, and the amount of postoperative discomfort has been minimal. In no instance was catheterization necessary beyond what is usually necessary following cesarean section. Morbidity occurred in 1 patient who had been in labor with ruptured membranes and who suffered from a mild endometritis after operation. However, her eventual recovery was satisfactory. Morbidity in another was due to pyelitis, which appeared on the seventh postoperative day. No patient complained of backache or unusual pains in the lower

extremities. There were no maternal deaths in our series.

In 48 cases perfect analgesia was obtained. The other 2 included in this series were failures because of inability to insert the needle in 1 case and failure of fusion of the sacrum in the other. These 2 cases demonstrate the fact that it is not possible to give every patient caudal analgesia.

Metycaine was used in all these cases. The minimum amount necessary was 30 cc., the maximum 320 cc., with an average of 81.8 cc.

The minimum duration of the operation was fifteen minutes, the maximum seventy-five minutes and the average, thirty-eight minutes. There is no necessity to hasten the performance of a cesarean section under this procedure because with the needle still in place repeated injections can be given as required. The important thing to remember is to repeat the injection at the slightest evidence of loss of good analgesia.

We do not perform a routine type of cesarean section. The low classic operation has given us very satisfactory results for women who have not been in labor, who have not been examined and whose membranes have not ruptured. The low segment operation is performed when the patient has been in labor, has been examined or has ruptured membranes. If there is any suspicion of potential infection, the Waters modification of the Latsko operation is the procedure of choice. In our series types of operation performed are given in table 2.

TABLE 2.—Types of Operation

Low classic and sterilization.....	11
Low classic.....	27
Low segment operation.....	7
Low classic, myomectomy.....	1
Low classic, salpingectomy.....	1
Waters modification of Latsko.....	8

The extraction of the child is accomplished without pain, but care should be taken not to manipulate the uterus before the incision is made. In 1 of our cases in which the uterus was in dextrorotation and necessitated replacement before incision of the anterior wall the uterus contracted so vigorously that difficulty was experienced with extraction of the child. All babies cried lustily immediately after delivery and none needed resuscitation. All babies except 1 were discharged from the hospital in good condition. One baby was delivered of a seriously toxic mother at five and one-half months and succumbed within eight hours after birth. We do not consider this fetal death attributable to the analgesic agent. Had any other analgesia been used the child probably would not have breathed at all.

The average estimated blood loss in all these cases was 100 cc. In both vaginal and abdominal deliveries under caudal analgesia we have been impressed by the definite decrease in loss of blood. For several years we have been giving one of the ergot or posterior pituitary preparations intravenously in all cesarean sections immediately after extraction of the child. This routine was carried out in the first few of these cases under caudal analgesia but was discontinued when it was found to be unnecessary. However, we do give these preparations intramuscularly as a routine procedure.

The patients are greatly benefited by the administration of morphine and scopolamine immediately after abdominal section or vaginal delivery. This medication relieves the discomfort associated with episiotomy when the analgesic effect has been exhausted.

COMMENT

For some time we have been endeavoring to evaluate various anesthetic and analgesic methods, particularly in cesarean section. Although a definite conclusion cannot be reached after studying a series of only 50 cases, we feel from our observation of this method that it is superior to any other that we have tried. Because of the excellent results in both vaginal delivery and cesarean section, we believe that this method of relieving pain is perfectly safe when given by a trained person in a well equipped maternity department. We have been particularly impressed by the absence of nausea, the complete relaxation of the abdominal wall, the smooth convalescence of the mother with the absence of discomfort after operation and the fact that no baby in this series required resuscitation.

The enthusiasm with which those patients who have had previous sections under inhalation anesthesia accept this new method is very gratifying to us, and the family's reaction is quite different when the patient is returned to her room in a cheerful, wide awake condition.

Although the average person takes this type of analgesia well, it is especially beneficial in cardiac cases, toxemias and upper respiratory infections.

We would like to call attention to the following observations: First, should there be a drop of blood pressure, it returns to normal immediately after delivery of the child; second, perfect analgesia must be obtained before the operation is started; third, the level of analgesia must be maintained throughout the entire procedure.

Our results have been so satisfactory that we feel justified in continuing the use of continuous caudal analgesia until a larger series has been observed.³

SUMMARY

Of 50 patients operated on under continuous caudal analgesia, 48 had perfect results and 2 were failures because of inability to introduce the analgesic agent.

All mothers recovered. There were 2 cases of morbidity not attributable to the use of this method.

Forty-nine babies were discharged from the hospital. One baby born at five and one-half months' gestation died.

Two patients had a drop of blood pressure beyond the average of 26 millimeters.

807 Spruce Street.

3. Since this article was written, our series has increased to 67 cases. Results in the last 17 cases were as satisfactory as in the preceding 50.

Clinical Observations on Itching.—It is obvious from experiments performed early in this century that itching is somehow related to cutaneous pain. In pathological cases of sensory dissociation, in local anesthesia and in asphyxial nerve block the perception of itching disappears and reappears with the pain perception. Complete analgesia is always connected with loss of itching sensitivity, and in cases of complete tactile anesthesia with unimpaired pain sense the itching sensitivity is unimpaired too. Also it has been shown that itching is independent of the temperature senses. Special points in the skin surface responding with itching alone to any stimulus could not be detected, but it was found that pain and itching points have the same density and that they cover each other. The interpretation of all these results was that itching is mediated by pain receptors and pain fibers.—Rothman, Stephen: *The Nature of Itching*, Research Publications, Association for Research in Nervous and Mental Disease, Baltimore, Williams & Wilkins Company, 1943.

Clinical Notes, Suggestions and New Instruments

IDENTIFICATION OF INFLUENZA VIRUS TYPE A IN CURRENT OUTBREAK OF RESPIRATORY DISEASE

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Under the direction of the Influenza Commission of the Board for the Investigation and Control of Influenza and other Epidemic Diseases in the United States Army, observation posts have been set up in various parts of the country for early detection of influenza in Army personnel.

In the Virus Laboratory of the University of Michigan School of Public Health, such observations have been carried out for more than a year. On May 28, 1943 in the course of one of many routine surveys, several patients ill with influenza were seen at the Station Hospital, Fort Custer, Michigan. A strain of influenza virus, type A (Weiss), was isolated from the throat washings of 1 of these men, and in 2 other cases positive serologic evidence of type A infection was obtained. Since no epidemic prevalence of influenza or other respiratory disease was noted at that time and the usual seasonal decline followed, it appeared that type A influenza virus could be the cause of sporadic disease.

From the middle of October 1943 the Army Specialized Training Program Unit at the University of Michigan was under constant detailed observation for respiratory disease. On Nov. 17 and 18, 1943 several cases resembling mild influenza appeared at sick call. On November 18 throat washings from 4 of these were inoculated intranasally into ferrets and mice. In 2 instances the ferrets responded, after an incubation period of forty-eight hours, with sharp febrile reactions and nasal signs resembling those usually seen in infection with influenza A. Material from these ferrets obtained at autopsy on the third day was inoculated into the chorioallantoic sac of chick embryos, some given intranasally to mice and some passed to additional ferrets. Eggs of the first passage of one revealed the presence of red cell agglutination¹ in the allantoic fluid. Type A influenza virus was identified by the agglutinin inhibition reaction. Type A virus was also identified in eggs inoculated intrallantoically with material from the second ferret passage of the other throat washing.

Mice of the third passage of those inoculated with the original throat washings from 1 patient developed pulmonary lesions due to influenza A virus. Influenza A virus was established in mice inoculated with material from the second ferret passage of the throat washings from the second patient. Mice inoculated with throat washings of these 2 patients were immune to the PR8² and Weiss (May 1943) strains of influenza virus type A when tested fourteen days later with 10 to 100 lethal doses intranasally. They were not immune to the Lee strain³ of influenza type B. Ferrets allowed to recover from inoculation developed antibodies to type A virus. Study of the acute and convalescent serums of the patients revealed a sharp rise in antibodies to type A virus but not to type B.

The same procedures carried out with the other 2 specimens from clinically similar cases failed to yield any evidence of the presence of influenza A or B. Studies of antibody titers of acute and convalescent serums from additional cases of influenza-like respiratory disease occurring during the first few days of the outbreak have revealed that a definite proportion of illness was not due to influenza A or B.

The present report serves to detail the detection of influenza virus type A at the onset of an epidemic in a Middle Western post before the disease was known to be present in other parts of the country.

From the Department of Epidemiology and the Virus Laboratory, University of Michigan School of Public Health.

These investigations were aided through the Commission on Influenza, Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army, Preventive Medicine Division, Office of the Surgeon General, United States Army.

This study was also aided by a grant from the International Health Division of the Rockefeller Foundation.

1. Hirst, G. K.: *Science* **94**: 22 (July 4) 1941.

2. Francis, Thomas, Jr.: *Science* **80**: 457 (Nov. 16) 1934.

3. Francis, Thomas, Jr.: *Science* **92**: 405 (Nov. 1) 1940.

Special Article

DANGERS OF METHYL CHLORIDE AS
SUBSTITUTE FOR FREON

A STATEMENT BY THE ASSOCIATION'S COMMITTEE
TO STUDY AIR CONDITIONING

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NEW YORK

C. P. YAGLOU, M.S.
BOSTON
AND

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Chairman of the Committee
DETROIT

Freon (dichlorodifluoromethane), long used as the refrigerant of choice in some types of air conditioning and refrigeration, has become little available through military requirements. This substance is now largely preempted for use as a disperser for one or more insecticides. This gas is almost wholly free of toxic properties, as a result of which engineers, servicemen, physicians and hygienists have become decreasingly aware of earlier disastrous events associated with more dangerous forms of refrigerants.

The mechanism earlier used with Freon does not lend itself to the ready substitution of any and all other refrigerants without extensive alterations. In fact, about the only other refrigerant that may be used in the same mechanism is methyl chloride (CH_3Cl). Even this refrigerant requires some adaptation, such as solves valve changes and the elimination of aluminum and certain other less common metal parts. In contact with aluminum, methyl chloride forms aluminum trimethyl. Practical requirements are leading to the widespread substitution of methyl chloride for Freon, and many governmental specifications call for the use of methyl chloride for air conditioning and refrigeration purposes.

This gas is both toxic and, under some circumstances, explosive. Its general properties are set forth in *Chemical and Engineering News*.¹ Its toxic properties are well described in the article "Methyl Chloride Poisoning from Domestic Refrigerators" by McNally, Kegel and Pope.² Publications now available imply a relative lack of injurious properties of methyl chloride, and in some the statement appears that the toxic threshold for short periods of exposure begins only at such relatively high concentrations as 750 parts per million. To the contrary there exist unpublished data that apparently prove that at least among animals injury may begin with more dilute concentrations and on the order of 100 or 200 parts per million. For sustained exposures it may develop that concentrations higher than 50 parts per million are undesirable. Heretofore emphasis has been placed on acute poisoning with scant reference to chronic states. It is now believed that repeated exposures at intervals such as one week apart may lead to cumulative damage. Already over the country a few minor disasters have occurred, chiefly connected with explosions.

In a recent engineering publication³ a summary of precautions has been published, chiefly connected with

the processes involved in the change over from Freon to methyl chloride. A few of them there appearing are here shown:

- Methyl chloride is toxic and inflammable.
- Do not use methyl chloride in systems where it will come in contact with aluminum or zinc.
- Test the system for leaks BEFORE charging with methyl chloride.
- Do NOT use a halide torch when testing for leaks AFTER the system has been filled with methyl chloride.
- Increase superheat setting of "Freon"-charged thermal expansion valves to maximum. (New orifice may also be needed to reduce capacity of valve.)
- Install dryer in liquid line.

It is not the purpose of this concise statement to condemn the use of methyl chloride. Instead it is desired merely to indicate that the number of instances of methyl chloride poisoning may increase, and that physicians caring for patients employed about air conditioning or refrigeration enterprises should be alert to the emergencies, acute and chronic states that may be induced by methyl chloride under conditions not always certain to attract the attention of the work of patients themselves.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION
OF THE FOLLOWING REPORT.
HOWARD A. CARTER, Secretary.

SONOTONE AUDIOMETER, MODEL 20,
SERIAL NO. 573, ACCEPTABLE

Manufacturer: The Sonotone Corporation, Elmsford, N. Y.
The Sonotone Audiometer, Model 20, is designed to measure the acuity and range of hearing. In the Council's investigation of the instrument, the audiometer was calibrated to determine whether it complied with the minimum requirements for acceptable audiometers of the Council on Physical Therapy.¹

All measurements were made with a 115 volt alternating current, 60 cycle power supply. The acoustical output of the air conduction receiver was measured on a coupler at the audiometer frequencies 128, 256, 512, 1,024, 2,048, 4,096 and 8,192 cycles only.

The instrument is equipped for testing with air and bone conduction. The frequency of the test tones remains within ± 5 per cent of the designated value under the manufacturer's indicated operating conditions. Dials are marked so that frequencies may be identified readily.

Each indicated attenuator level produces a sound pressure which is within ± 5 decibels of the value referred to normal threshold. The normal threshold is that determined in the National Health Survey Hearing Study. Each attenuator step is 5 ± 1.5 decibels.

Range of intensity (air conduction only): The intensity range of the test tones above the normal threshold is at least that as follows:

Test Tone Cycles per Second	Intensity Range Decibels
128	60
256	80
512	85
1,024	90
2,048	90
4,096	90
8,192	70

The sound pressure amplitude of the harmonics in the output of the air conduction receiver does not exceed 3 per cent of the amplitude of the corresponding fundamental frequency.

The frequency dial is calibrated in the traditional octave scale (128, 256, 512, 1,024, 2,048, 4,096, 8,192) and also in the closely equivalent scale (125, 250, 500, 1,000, 2,000 and so on) for easy

1. Chem. & Engin. News 21:1254 (Aug. 10) 1943.
2. Kegel, A. H.; McNally, W. D., and Pope, A. S.: Methyl Chloride Poisoning from Domestic Refrigerators, J. A. M. A. 93:353 (Aug. 3) 1929.
3. Heating, Piping & Air Conditioning 15:521 (Oct.) 1943.

1. Minimum Requirements for Acceptable Audiometers. J. A. M. A. 120:838 (Nov. 14) 1942.

interpolation when exploring by sweep methods. The nature of the electrical circuit is such that the frequency is stable, and no zero adjustment of the frequency dial is required.

The air conduction receiver is of the dynamic type, and both the air and bone receivers are especially designed for audiometric purposes.

A masking circuit and receiver are included with separate controls. The masking spectrum is sufficiently broad to provide effective masking at all the audiometer frequencies.

A signal button on a cord is provided for the person who is being tested. An interrupter that introduces no extraneous identifying sounds permits easy determination of threshold values.

A control on the panel allows the audiometer to be set for bone or for air conduction testing. The instrument is inoperative if the air conduction receiver is plugged in while the instrument is set for bone conduction or vice versa. As the control is changed from one of these test positions to the other, a shifting window selects the correct hearing loss values to be read. Receiver plugs are of different types so that the bone, air and masking receivers can be connected only to the proper terminals.

The Council on Physical Therapy voted to accept the Sonotone Audiometer, Model 20, for inclusion in its list of accepted devices, since the instrument was found to comply with the Council's minimum requirements for acceptable audiometers.

Council on Pharmacy and Chemistry

REPORT OF THE COUNCIL

THE COUNCIL HAS WATCHED CLOSELY THE TREATMENT OF THE MENINGITIDES. BECAUSE OF THE DIFFERENCES IN OPINION OF THE VALUE OF ANTIMENINGOCOCCIC SERUM AND MENINGOCOCCUS ANTITOXIN, IT WAS DECIDED TO PREPARE A STATUS REPORT. ACCORDINGLY, DR. HOBART A. REIMANN WAS APPROACHED FOR ASSISTANCE IN PREPARING SUCH A REVIEW. LETTERS WERE DIRECTED TO TWELVE PERSONS (NOT INCLUDING DR. REIMANN) IN CIVILIAN PRACTICE AND THE ARMED FORCES TO ASCERTAIN THEIR EXPERIENCE. THE FOLLOWING STATEMENT REPRESENTS THE CONSENSUS, AND ITS PUBLICATION HAS BEEN AUTHORIZED BY THE COUNCIL, WHICH WISHES TO EXPRESS ITS APPRECIATION OF THE EFFORTS OF DR. REIMANN AND THE OTHERS WHO AIDED IN THE SURVEY.

AUSTIN E. SMITH, M.D., Secretary.

STATUS OF ANTIMENINGOCOCCIC SERUM AND MENINGOCOCCUS ANTITOXIN

All authorities are agreed on the value of sulfonamide chemotherapy in the treatment of meningitis and septicemia due to the meningococcus organism. Mortality rates in the hands of some physicians have been less than 5 per cent with chemotherapy, and these workers do not believe that antimeningococcic serum given in addition to chemotherapy is of any value; in fact, some suggest that serum may at times even be harmful and contraindicated. The chief disadvantages of serum are its bulkiness, expense, perishability, the complexities of its administration and the frequency of prolonged convalescence from serum sickness.

Many clinicians feel that at present serum should be used only for (a) patients who are sensitive to sulfonamide compounds and (b) patients in whom the meningococcus is or becomes drug resistant. The former criterion (a) is of course valid, but it is an uncommon occurrence; the latter (b) apparently is rarer. According to one worker there is little evidence to indicate that drug resistant meningococci have been encountered in meningitis. Another reports only 1 case out of 2,000 in which the meningococcus seemed to be resistant to sulfadiazine. Several have suggested that serum, in addition to sulfonamides, might be of value in the rare cases of fulminating infection if no specific antibodies can be demonstrated in the patient's serum, but death often occurs before the diagnosis is made, before the meningococcus is classified, before antibodies can be studied or before serum is obtainable or administered. Perhaps antimeningococcic serum should be retained for use in cases in which sulfonamides cannot be used, but instead of using the serum customarily prepared in horses, refined, monovalent concentrated rabbit serum is preferable. In experimental

studies, rabbit serum was found to be ten times as potent as horse serum and is far more easily prepared.

Meningococcic Antitoxic Serum.—As regards Meningococcic Antitoxic Serum, several authorities do not recommend its use. Others feel that there is no evidence that an exotoxin is made by the meningococcus but that endotoxins may be operative. It is universally believed that endotoxins are poor antigens. In cases in which antitoxin seemed to be helpful, it is believed that the antibacterial agents present in the preparation, not the antitoxin, were responsible. Two consultants alone feel that antitoxin might be of value in the severe fulminating case to neutralize quickly the hypothetical toxin.

Penicillin.—There may be no need at all for antibacterial serum if penicillin proves to be successful in treatment, either in replacing the sulfonamides entirely, which is unlikely, or for use in sulfonamide sensitive patients or for sulfonamide resistant meningococci. One investigator already reports success in this direction.

COMMENT

It is the consensus that sulfonamide therapy (sulfadiazine) is at present the method of choice in the treatment of meningococcic meningitis and septicemia. For the few patients who are sensitive to sulfonamides and for the still rarer instances of infection with sulfonamide resistant meningococci, the available potent, type specific horse antimeningococcic serum alone should be used intravenously, never intrathecally, in adequate dosage with promptness and precision. But because of the instances in which sulfonamides cannot be used with success there is no justification for the continued widespread manufacture, distribution and stocking of serum. A limited supply available at conveniently placed centers for prompt distribution would seem to be adequate. If proved by clinical trial to be as superior to horse serum as experiments now indicate, the use of concentrated, refined, monovalent serum prepared in rabbits should preferably be used, intravenously, never intrathecally.

There is no evidence to prove that combined chemosotherapy is superior to chemotherapy alone and no firm evidence to support the use of the meningococcic antitoxic serum which is now available. Further studies are needed to determine whether an endotoxin or exotoxin plays a role in the infection and whether a potent antitoxin can be made for successful use in fulminating cases.

Should penicillin prove to be successful in curing meningococcic meningitis and/or septicemia in patients who are sulfonamide sensitive or in whom the meningococci are or become sulfonamide resistant, there will be no further need for the use of antimeningococcic serum.

SUMMARY

Consideration of the available evidence revealed that few seem to be much concerned with the use of serum and that only in exceptional cases. It is also noted that the serum suggested (rabbit serum) is one which has never been submitted to the Council or, as far as is known, used clinically. Accordingly, the Council voted to omit Antimeningococcic Serum and Meningococcus Antitoxin from New and Nonofficial Remedies, the accepted preparations to be omitted at the end of the longest period of acceptance for any of these products.

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

AUSTIN E. SMITH, M.D., Secretary.

SULFAPYRIDINE (See New and Nonofficial Remedies, 1943, p. 179).

The following dosage form has been accepted:
WILLIAM R. WARNER & Co., INC., NEW YORK
Tablets Sulfapyridine: 0.5 Gm.

SULFATHIAZOLE (See New and Nonofficial Remedies, 1943, p. 182).

The following dosage form has been accepted:
WILLIAM R. WARNER & Co., INC., NEW YORK
Tablets Sulfathiazole: 0.5 Gm.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, JANUARY 8, 1944

AMERICAN MEDICAL ASSOCIATION HOLDS ANNUAL SESSION IN 1944

Announcement has been made officially that the American Medical Association will hold its 1944 annual session June 12-16 in Chicago. The House of Delegates will meet in the Palmer House, where the Scientific Exhibit and the Opening General Meeting will also be held. The Registration Bureau and the Technical Exhibits will be in the Hotel Stevens, and the meetings of the various sections will be assigned to these hotels and in addition to the Hotel Sherman and the Morrison Hotel.

A prospective feature of the annual session is a national medical war meeting at which there will be present distinguished representatives of the medical military services of the United Nations as well as other eminent speakers. The program and the place of this and other meetings will be announced as plans are completed. At the Conference of Section Secretaries with the Council on Scientific Assembly held in the headquarters of the American Medical Association in December, consideration was given particularly to salient features of the scientific programs. Plans were made for many round table and panel discussions and for symposiums on subjects of current interest, including such topics as the amino acids and the vitamins in nutrition, the dysenteries, postwar trends in obstetrics, industrial ophthalmology, new advances relating to the uses of penicillin and the sulfonamides, head injuries, asphyxia, the neuroses, fatigue, nutrition and rehabilitation, new aspects of endocrinology and urology, malaria and other tropical diseases, blood transfusion and new advances with blood and blood substitutes. A special section will be devoted to the interests of the general practitioner, and section officers have been appointed to work out a program designed particularly for this group. Already the applications for places on the program are sufficient to indicate the usual assembling of scientific discussions enhanced by new methods of presentation and exhibition.

Since the transportation and hotel facilities of Chicago are likely to be taxed to the utmost under war conditions, those who plan to attend the annual session should make the necessary reservations just as soon as the official announcement appears in the Organization Section of THE JOURNAL and in the advertising pages in the near future.

HIGH ALTITUDE FROSTBITE

Davis and his associates¹ call attention to some particular features of the frostbite incurred by airmen which differ from the features of frostbite incurred by ground forces during severe winter weather and from those of the frostbite of the immersion foot of shipwrecked seamen. Among the factors which contribute to the peculiarities of high altitude frostbite are the extreme degrees of cold encountered, such as minus 40 to 50 C., and the varying degrees of existing anoxemia and ischemia. Particularly noteworthy is the predilection of high altitude frostbite for the extremities, whereas the face and other exposed portions of the body are not affected. The great difference in cold tolerance between the tissues of the cheek and the fingers cannot be explained satisfactorily on the basis of the greater heat radiating surface of the fingers. Whereas the heat radiating surface per tissue mass in the fingers is three to four times greater than that in the cheek, the susceptibility to cold is fifty to one hundred times as great. Localized anoxemia resulting from the ischemia produced by intense reflex vasospasm of peripheral arterioles is probably the most important factor in establishing the peculiarly selective effect of cold on the digits of both upper and lower extremities. Exposure of one to two minutes suffices to render the fingers painfully cold, numb, stiff, waxy white in appearance and completely insensitive to touch. They feel hard and even brittle and cannot be flexed or extended voluntarily. The surface temperatures, as recorded by thermocouples, may be 4 to 6 degrees centigrade colder than the corresponding fingers of the unaffected hand. Capillary microscopy of the affected fingers in this early stage shows no blood in the terminal capillaries on the dorsum of the fingers about the nail beds. This would appear to be the result of an initial intense vasomotor spasm of the terminal portions of the arterioles and, in some instances, of a secondary thrombosis at the point where the arteriole passes into the capillary. The clinical types vary from mild to severe forms, the latter being described either as wet or as dry. The wet form is characterized by vesicles and dropsical blisters, the superficial layers of the skin becoming dissected away from the deeper layers by extravasated fluid. When

1. Davis, Loyal; Scarff, John E.; Rogers, Neil, and Dickinson, Meredith: High Altitude Frostbite: Preliminary Report, Surg., Gynec. & Obst. 77: 561 (Dec.) 1943.

this skin dries and hardens it is cast off, frequently in the form of a complete cast of the part. The dry type of high altitude frostbite cannot be differentiated in the early stage from the wet. However, it progresses to characteristic gangrene. The tissues shrivel and mummify and eventually become hard and coal black.

The basic morphologic lesion in high altitude frostbite, according to the authors, consists in damage by cold to the endothelium of the terminal capillary loops. In mild cases this results only in a pathologic permeability of the capillary walls; but in the more serious cases a thrombus formation occurs at the arteriolar-capillary junction. Davis found in severe cases a remarkable thickening of the intima of the vessels which resembles that seen in cases of endarteritis obliterans.

The authors experimented with protective ointments applied to the extremities of normal persons and of patients who had suffered injury from cold. Careful studies of skin temperature readings after controlled exposures yielded negative results. How much warmth should be applied to a frostbitten extremity during the early hours or days of treatment? Greene² insisted that frostbitten parts must be kept cool. He believed that the most favorable temperature was approximately plus 2 to plus 5 C. Application of heat to the frozen part, in his opinion, increased its metabolism and its oxygen requirement and encouraged the growth of bacteria. It also increased flow of blood to the parts, resulting in greater transudation and blistering. Davis and his associates treated a series of patients by keeping the damaged parts at controlled temperatures, approximating those advised by Greene, for periods ranging from twenty-four to forty-eight hours after the injury had been sustained. Simultaneously they also treated a second series of patients by exposing the damaged parts to room temperature. The results obtained by the latter method were equal to or better than those obtained by continued cooling. Attempts to accomplish peripheral vasodilatation by drugs such as amyl nitrite, glyceryl trinitrate, alcohol and acetylsalicylic acid administered both to normal persons and to patients with recent frostbites were likewise negative. The effect of these drugs on the peripheral capillary circulation was studied by means of electric thermocouples and through microscopy of the capillaries. None of the drugs caused an elevation of the temperature in the tested parts, nor did they cause a dilatation of the capillary bed. Blocking of the sympathetic nerve trunk and stellate ganglion with procaine hydrochloride was performed on patients suffering from acute vasoconstriction as a result of exposure to intense cold. Acute dilatation of the peripheral capillary bed could be effected in extremities in which there had not been permanent anatomic injury to the capillary wall or

thrombosis at the arteriolar-capillary junctions. When thrombosis or irreversible injury to the capillary wall had taken place, blocking of the sympathetic trunk and the stellate ganglion failed to produce either a rise in the temperature of the finger tips or a reappearance of blood in the terminal capillary beds.

THE SOVIET UNION AGAIN REVERSES ITS STAND, THIS TIME ON COEDUCATION

On June 27, 1936 the Central People's Health Committee of the Soviet Union passed a law prohibiting abortion except in the presence of stringent indications. Thus it completely reversed its stand of 1920, when it legalized artificial abortion. Simultaneously a number of measures calculated to lighten the burden of childbearing and induce the rearing of large families were proposed. Both Germany and Italy were, at the same time, encouraging the rearing of large families in their respective countries. One of the objections to the legislation, principally from Russian women, was that it represented an encroachment on the woman's right to determine whether she chooses to become a mother or not. As *THE JOURNAL* commented,¹ the attitude of the Soviet medical profession and in particular of the obstetricians and gynecologists was in sharp contrast to these views. According to one of the authorities (Professor G. A. Baksht) "The accumulated experience since 1920 furnishes abundant proof that an artificial abortion is a serious evil and that the operation even when performed *lege artis* leads to a number of injurious effects."

Now the Russians have decided to end coeducation in elementary and intermediate schools. Coeducation was introduced by the Bolsheviks not for any definite pedagogic reason but principally because it was to be one more step in the emancipation of woman and the accomplishment of sex equality. Now it is argued in favor of segregation that boys and girls do not develop physically and mentally along parallel lines at certain periods of their lives. Thus, the school program which the girl from 11 to 14 years of age can carry on with ease is too great a strain for boys of the same age, while the general capacities of girls from 14 to 17 years of age are somewhat lowered. There is also the necessity of a different educational approach to boys from that to girls in various phases of their development, the necessity of different presentation of material and of different methods of teaching and working. This differentiation cannot be obtained if boys and girls are in the same class. Then there is the inescapable division of labor between men and women. Women have responsibilities which do not apply to men, and those responsibilities are of crucial importance in the survival of the nation. Women are

2. Greene, Raymond: Frostbite and Kindred Ills, *Lancet* 2: 689 (Dec. 6) 1941.

1. The Soviet Union Reverses Its Stand on Legalized Abortion, editorial, *J. A. M. A.* 107: 1391 (Oct. 24) 1936.

mothers, and they must be able to look after children and to rear them. Separate education will result, among other things, it is believed, in strengthening the Soviet family. The emphasis on training for motherhood and rearing of families suggests that the motivating factor behind this measure is a long range program for increased manpower. This supposition finds support in the fact that Russia has reputedly lost some 17,000,000 of her population in the present holocaust.

Coeducation has fared well in the United States; few pedagogues of any importance clamor for segregation. Moreover, there has been a persistent increase in the birth rate to 24 per thousand of population with 3,200,000 births in 1943, an excess of more than 200,000 over 1942. What will be the results of this new experiment in the Soviet Union? The experimental approach to social problems, whatever the motivation, holds a greater promise than rigid adherence to the tenets of Marx or any other philosopher in the field of government.

Current Comment

FLUORIDE AND DENTAL CARIES

The protective action of fluoride against dental caries was first indicated by epidemiologic studies¹ which disclosed an inverse relationship between the prevalence rates of dental caries and the fluoride concentration of the municipal water supplies. Relatively low incidence of caries was found associated with the use of domestic waters whose fluoride concentration had a range of one or more parts per million.² Next, laboratory studies³ revealed that salts of fluoride could inhibit the experimental production of caries in the molar teeth of rats. On the basis of this evidence, clinical investigations were undertaken in an attempt to control dental caries by the prophylactic and therapeutic use of fluoride salts. A method was devised by Cheyne⁴ for the topical application of fluoride to the teeth without the attendant danger of its systemic ingestion or absorption. Briefly, the method consists in thorough cleaning of the teeth, which are then isolated by means of cotton rolls and dried with compressed air. A solution of sodium fluoride is then applied to the crown surfaces of the teeth and allowed to remain in contact with the surfaces for at least two minutes, during which the solution is dried. The effectiveness of this therapy was analyzed by Cheyne in a group of 27 children with carious deciduous teeth as compared to a control group with similar lesions who did not receive treatment. After a three months period dental exami-

nation showed that the treatment had effected a 50 per cent reduction in the incidence of dental caries and had been equally effective in suppressing carious activity in the preexisting lesions. This observation was confirmed by Bibby⁵ with the topical application of 0.1 per cent solution of sodium fluoride to one quadrant of the mouth, using the other side of the same jaw as control. A 40 per cent reduction in the activity of caries in the treated quadrant was observed in a group of 78 children periodically examined for two years after the treatment. Knutson and Armstrong⁶ more recently have used the same procedures, applying topically a 2 per cent solution of sodium fluoride. Two hundred and eighty-nine treated children, as compared to 326 control children, exhibited a reduction of 40 per cent in the incidence of dental caries. In this group the treatment was ineffective in preventing new attacks by caries on teeth already attacked, which was taken as an indication that the method was without effect in the control of active dental caries. As the analysis of activity in caries is dependent on a highly subjective criterion, further data will be required in order to warrant any definite statement as to the therapeutic effect of fluoride. Further, as an excess of fluoride is bound to produce chronic dental fluorosis, commonly known as mottled enamel, it is necessary to determine the minimum effective concentration of the element which will prevent carious lesions without at the same time injuring the teeth.

THE FIRST CANCER CONGRESS OF MEXICO AT GUADALAJARA

In these times, when inter-American relations are so important, the organization of a cancer congress by Mexico was timely. It brought together medical men of different American nations and gave them an opportunity of getting first hand information about interesting scientific developments in the Mexican republic. Mexican medicine is now at a transitional stage in many ways comparable to that of the United States several decades ago. Contrast is everywhere in Mexico. Whereas some Mexican clinical or scientific institutions are primitive, others are as up to date as the most modern institutions of this country—such as the institutes of cardiology, pediatrics and public health of Mexico City. One must add the magnificent units built by the Spaniards in colonial times, such as the orphanage in Guadalajara, which is still in perfect condition and is still serving its purpose. Whereas research in cancer, for instance, is yet in an elementary stage, the Mexican investigations in rickettsial diseases are among the most brilliant in the world. Although some of the surgical institutions may be faulty as far as organization is concerned, the operative skill of the Mexican surgeon is amazing. The cancer congress reflected the present stage of Mexican medicine. Whereas contributions to the theoretical side of the problem were few, the clinical papers were numerous

2. Mountin, J. W.; Pennell, E. H., and Nicolay, Virginia: Location and Movement of Physicians, 1923 and 1938: Turnover as a Factor Affecting State Totals, Pub. Health Rep. 57: 1752 (Nov. 20) 1942.

1. Dean, H. T.: Endemic Fluorosis and Its Relation to Dental Caries, Pub. Health Rep. 53: 1443 (Aug. 19) 1938.

2. Dean, H. T.: Domestic Water and Dental Caries, Pub. Health Rep. 57: 1155 (Aug. 7) 1942.

3. Miller, B. F.: Inhibition of Experimental Dental Caries in the Rat by Fluoride and Iodoacetic Acid, Proc. Soc. Exper. Biol. & Med. 39: 389 (Nov.) 1938. Hodge, H. C., and Finn, S. B.: Reduction in Experimental Rat Caries by Fluorine, *ibid.* 42: 318 (Oct.) 1939.

4. Cheyne, V. D.: Human Dental Caries and Topically Applied Fluorine, J. Am. Dent. A. 29: 804 (May) 1942.

5. Bibby, B. G.: The Effect of Sodium Fluoride Applications on Dental Caries, J. Dent. Research 22: 207 (June) 1943.

6. Knutson, J. W., and Armstrong, W. D.: The Effect of Topically Applied Sodium Fluoride on Dental Caries Experience, Pub. Health Rep. 58: 1701 (Nov. 19) 1943.

and of good quality. Some consisted of reviews of the different types of cancer, especially useful for the general practitioner and also for students, who attended the sessions in large numbers. Several of these lectures were given by Americans, forty of whom, mostly from the Southern states, attended the congress. Dr. R. R. Spencer, director of the National Cancer Institute, gave a paper on the program of work conducted at Bethesda, Md., while comparable papers on cancer control were read by Drs. Baeza and Valdés. Operative clinical sessions were held every day and proved the statement concerning the high level of Mexican surgery. The congress was organized by its president, Dr. G. Vazquez Arroyo of Guadalajara. It was sponsored by the president of the republic and by federal and state authorities and was supported by a large grant from the Mexican government. The program of entertainment was varied and was conducted with characteristic generosity. In the closing session Monterrey was selected as the place for the celebration of the second Mexican Cancer Congress, in 1945.

MEDICAL SCIENCE CENTER FOR DETROIT

Under the auspices of the board of directors of Wayne University in Detroit a project is now under way to create a \$50,000,000 Medical Science Center to be built around Wayne University's College of Medicine. The proposal involves the erection of a dozen buildings including a library of medical sciences, new buildings for the schools of medicine, dentistry, pharmacy and nursing and allied subjects, an institute for graduate study and an institute of industrial health. The population and the characteristic industries of the city of Detroit unquestionably make it an excellent location for a great medical center and particularly for an institute of industrial health. The advances of modern medical science make necessary renovation and rebuilding of laboratories. The need for a medical center in Wayne County has long been recognized. A 53 acre site has been earmarked adjacent to the hospitals and medical office buildings of Detroit, and a special nonprofit corporation has been developed to raise the necessary funds and to guide the development of the new institution. The first unit—namely, the hospital—is to serve patients requiring public assistance and will be erected by Wayne County. No doubt the city and state will find it convenient to develop their medical care program in relationship to this medical center. Unique, however, is the proposed institute of industrial health. A few of our great universities now offer courses in this field, and many of the state medical societies, led by the Council on Industrial Health of the American Medical Association, have provided study in industrial health. Detroit is recognized as an industrial capital. Many of its great industries have already developed units in preventive and industrial medicine which have contributed to research and progress in this field. The concept of an industrial health institute as a part of a medical science center deserves all the encouragement that the medical profession can give.

THE AMERICAN MEDICAL ASSOCIATION AND THE NATIONAL PHYSICIANS' COMMITTEE

A statement released by Senator James E. Murray of Montana, whose name is familiar to physicians as one of the participants in launching the Wagner-Murray-Dingell bill, charges that the American Medical Association has set up a committee in Chicago which is sending out a huge amount of propaganda intended to distort and falsify the bill and cites a pamphlet published by the National Physicians' Committee. Simultaneously with this release Dr. E. H. Cary, president of the board of the National Physicians' Committee, issued a statement to the effect that the committee "is in no way connected with the American Medical Association except in that it is a committee of physicians and the physicians are members of the Association." From the headquarters office a statement was issued to the effect that "there is no connection whatsoever, officially or in the form of financial support, between the American Medical Association and the National Physicians' Committee, except that the House of Delegates of the American Medical Association has given its approval to the efforts not only of the National Physicians' Committee but of any other reputable organization that will aid in defeating this pernicious legislation." Senator James E. Murray would render the American people a better service by making certain of the alleged facts before making unwarranted charges. The proponents of the Wagner-Murray-Dingell bill must find the going tough if it is necessary to support it by this type of propaganda.

PENICILLIN IN THE TREATMENT OF RELAPSING FEVER

Relapsing fever is a tick or louse borne spirochetal infection which occurs endemically in most countries. With overcrowding and poverty, relapsing fever may become epidemic. According to the League of Nations report, more than 1½ million cases were observed in European Russia the year following World War I. Arsenic, usually arsphenamine, is said to be the most effective therapeutic agent. The occasional development of arsenic resistant spirochetes, the frequency of relapses and the hazards and complications which occur after arsenical therapy are disadvantages. The search for a more desirable agent has been made by Heilman and Herrell, who studied the effectiveness of penicillin against relapsing fever experimentally produced in mice by a single strain of *Borrelia novyi*. Although 100 Oxford units of penicillin per cubic centimeter did not cause a visible decrease in motility of spirochetes in vitro, 1,000 units to heavily infected mice was associated with their complete absence in the blood smear in two to three days. Of 26 treated mice only 1 (1 per cent) died, whereas in the control group 21 out of 27 (75 per cent) died. All untreated mice which survived exhibited relapses, while only 4 of the treated mice had a relapse. As the strains of the spirochete which produce relapsing fever are closely related, it is likely that penicillin will be effective also against other strains of this organism.

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeons General of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war, and such other information and announcements as will be useful to the medical profession.

ARMY

THE CALIFORNIA-ARIZONA MANEUVER AREA

The California-Arizona Maneuver Area, formerly known as the Desert Training Center, is organized as a training theater of operations with all functions of combat, supply and service paralleling as closely as possible like functions in an overseas theater of war. Medical service, including evacuation of actual sick and injured from maneuvering combat troops, is performed in a realistic manner by use of medical battalions, field and evacuation hospitals and finally general hospitals. There are three general hospitals in operation at present exclusively for California-Arizona Maneuver Area troops. These are theater of operation type construction, 1,000 bed rated capacity and staffed by numbered general hospital units. These numbered units operate the hospitals for approximately three months to give them necessary experience and training to qualify them for overseas assignment. The three general hospitals are located as follows and operated by the units indicated:

Beaumont, Calif., 22d General Hospital:

Lieut. Col. Adrian G. Gould, M. C., commanding officer.
Major Clarence H. Rommel, M. C., executive officer.
Major Emmet F. Pearson, M. C., chief of Medical Service.
Major Foster L. Dennis, M. C., chief of Surgical Service.
Lieut. Col. Elton E. Hankins, D. C., chief of Dental Service.
Lieut. Col. Frank T. Moore, M. C., chief of X-Ray Service.
1st Lieut. Bernard Stempel, M. C., chief of Laboratory Service.

Spadra, Calif., 34th General Hospital:

Col. Walter L. Richards, M. C., commanding officer.
Major Myron S. Jared, M. C., executive officer.
Major Barnard Davis, M. C., chief of Medical Service.
Lieut. Col. William B. Schaefer, M. C., chief of Surgical Service.
Major Kyle L. Rose, D. C., chief of Dental Service.
Capt. Thomas W. Knickerbocker, M. C., chief of X-Ray Service.
1st Lieut. William B. Chamberlin, M. C., chief of Laboratory Service.

Banning, Calif., 297th General Hospital:

Col. Francis W. Pruitt, M. C., commanding officer.
Major Gordon E. Snyder, M. C., executive officer.
Lieut. Col. George F. O'Brien, M. C., chief of Medical Service.
Lieut. Col. Chester C. Guy, M. C., chief of Surgical Service.
Lieut. Col. Joseph L. Uhl, D. C., chief of Dental Service.
Major Elbert K. Lewis, M. C., chief of X-Ray Service.
Lieut. Col. Alex B. Ragins, M. C., chief of Laboratory Service.

DISPOSITION OF PERSONS WITH NEUROPSYCHIATRIC DISORDERS

Circular Letter No. 194, issued December 3 by the Office of the Surgeon General, is concerned with the disposition of persons with neuropsychiatric disorders. At the present time over 45 per cent of the certificate of disability discharges are for neuropsychiatric reasons. The importance of eliminating actual or potential neuropsychiatric noneffectives has not diminished. However, the possibility must be considered that neuropsychiatric criteria for service are now being interpreted too strictly and men are being separated from the service who could be of value were they retained. Each case must be evaluated individually and disposition made on the basis of clinical judgment as to the individual's potential value to the service. It is well established that a large proportion of men developing psychiatric disorders, particularly in combat zones, if properly treated and promptly returned to duty, recover entirely and render valuable service. Any one, no matter how sound his personality,

may develop a psychiatric disorder under certain circumstances and will recover, if properly treated, when these circumstances are changed or when he has had an opportunity to adjust to them. An attempt should be made in each case to determine when the psychiatric disorder is merely the natural result of fatigue, misassignment or a distressing situation, or whether it is a manifestation of fundamental neuropsychiatric unsuitability for military service. Where the psychiatric disorder is believed to arise more from indifference toward the war than from fundamental instability of personality, the individual will be retained for service. Disposition of neuropsychiatric cases may be any of the three following:

1. *To full duty.* Individuals who, after careful study by examining medical officers, are believed to be of potential value at full duty in combat zones regardless of the psychiatric diagnosis which has been made will be returned to duty.

2. *To duty of less arduous nature than full duty in combat zones.* Individuals who, after careful study by medical officers, are believed to be noneffective for combat duty but potentially capable of serving in less arduous assignment, either in continental United States or overseas, will be returned to duty with a recommendation to this effect.

3. *Separation from the service.* (a) Individuals who, after careful study, are believed to be of no further value to the service because of the presence of psychosis, psychoneurosis, epilepsy or organic neurologic disease will be separated from the service under the provisions of section II, AR 615-360. (b) Individuals who, after careful study, are believed to be of no further value to the service because of the presence of mental deficiency, psychopathic personality or primary behavior disorders (such as chronic alcoholism or drug addiction) will be discharged under the provisions of section VIII, AR 615-360.

ELIMINATION OF UNNECESSARY LABORATORY WORK

The Office of the Surgeon General issued on November 30 Circular Letter No. 193, which is concerned with the elimination of unnecessary laboratory work. There has been a tendency on the part of section chiefs and ward officers in both medical and surgical sections to order laboratory work much beyond the actual need for the adequate care of patients. In view of the shortage of qualified laboratory personnel it is essential that laboratory work be reduced to a minimum. Reduction is desired in the following procedures, which appear to be carried out on an excessive scale at present: (1) blood cell counts, especially red cell counts and leukocyte differentials, (2) microscopic examination of urine, (3) bacteriologic cultures when smear examinations are diagnostic, (4) routine and repeated blood chemistry studies when the nature and course of the disease are clearly evident, (5) routine serologic tests for syphilis on admission and (6) sputum and stool examinations in individuals without symptoms of pulmonary or gastrointestinal disease. X-ray films, which are frequently made routinely, are not to be made when there is no clinical reason to suspect disease in the part x-rayed.

It is not intended that work essential for diagnosis and estimation of progress be curtailed. Prior to surgical operation, leukocyte counts, hemoglobin determinations and urinalyses are considered essential. Blood smear examinations for malaria

are of current great importance in the case of men returning from areas where malaria is endemic; search for parasites should be made carefully in this group. So that unnecessary work may be eliminated, individual consideration should be given to cases in determining the need for laboratory examinations.

This letter does not apply to examinations for induction, appointment and discharge, in which chest x-ray examination and certain laboratory tests are required.

FIFTIETH ANNIVERSARY OF THE ARMY MEDICAL SCHOOL

The Army Medical School, located at the Army Medical Center, Walter Reed General Hospital, Washington, D. C., marked its fiftieth anniversary December 18 with the award of certificates to the sixteenth class in military and tropical medicine to be graduated since August 1941. Col. Richard P. Strong, director of tropical medicine at the Army Medical School, presented certificates to the 124 graduates, which included officers of the Army of the United States, the Canadian and Peruvian armies, and officers of the state health departments. Major Gen. Norman T. Kirk gave the graduation address. Participating also at the graduation exercises, were Major Gen. Shelley U. Marietta, commanding general of the Army Medical Center, and Lieut. Col. Thomas T. Mackie, executive officer of the course.

The fiftieth anniversary of the founding of the Army Medical School in 1893 was commemorated by a brief ceremony presided over by Col. G. R. Callender, director of the school, and honoring Col. Deane C. Howard, who ranked first in the initial class to be graduated and who was retired in 1922. Colonel Howard was chief of the Division of Sanitation in the Office of the Surgeon General during World War I and holds the Distinguished Service Medal.

MEDICAL MEETINGS IN NORTH AFRICA

The 45th General Hospital, which was organized from the faculty of the Medical College of Virginia, Richmond, began holding medical meetings shortly after its arrival in North Africa. The meetings, which have been held the second and fourth Thursday of the month since April, have all been arranged by Major Guy W. Horsley, chief of the surgical service. The speakers and subjects have been varied, and many of the talks have been on personal experiences of the speakers in many corners of the world. One meeting was devoted to the experience of medical officers in the Tunisian campaign, another to the removal of foreign bodies, another to experiences in the Belgian Congo with tropical diseases, and still another to the experiences of the commanding officer of an infantry regiment with his medical troops in the Sicilian campaign. Invitations to attend these meetings are extended to all medical officers both in hospitals and attached to troops through notice published in the daily bulletin of the base section where this hospital is located. The 45th General Hospital will continue to hold these meetings, which have been well attended and have proved a great success, throughout its stay overseas.

MAJOR GEORGE W. BEELER AWARDED LEGION OF MERIT

The Legion of Merit was awarded to Major George W. Beeler, formerly of Texas City, Texas. The citation accompanying the award read as follows: "Capt. George W. Beeler, medical corps, United States Army, for exceptionally meritorious conduct in the performance of outstanding services during the period from Jan. 1 to Feb. 28, 1943, at Guadalcanal. As chief of the surgical service of a field hospital, operated by a medical battalion, Capt. Beeler successfully performed innumerable surgical operations requiring the highest degree of skill. He also was responsible in a large degree for the excellent surgical care of the patients of the field hospital, which averaged 350 patients constantly over a three month period. He worked untiringly to care for the needs of the wounded." Dr. Beeler graduated from the University of Texas Medical Branch, Galveston, in 1932 and entered the service in September 1941.

LIEUT. COL. WILLIAM C. MENNINGER APPOINTED CHIEF OF NEUROPSY- CHIATRIC BRANCH, SURGEON GENERAL'S OFFICE

The War Department recently announced the appointment of Lieut. Col. William C. Menninger as chief of the neuropsychiatric branch in the Office of the Surgeon General. He will fill the vacancy created by the death of Col. Roy D. Halloran, who died November 10 (THE JOURNAL, Nov. 20, 1943, p. 786). The primary objectives of the Army's neuropsychiatric service are to screen out at induction or eliminate later men whose mental instability is such as to render them unsuitable for combat or other duty, to aid in maintaining discipline and morale among all troops and to treat and rehabilitate men suffering from nervous disorders incurred in military service. Dr. Menninger graduated from Cornell University Medical College, New York, in 1924. He has been neuropsychiatric consultant for the Fourth Service Command since he was called to active duty Nov. 10, 1942.

CAPT. VICTOR V. VARE RECEIVES SILVER STAR MEDAL

Capt. Victor V. Vare, formerly of Jamaica, N. Y., and now serving somewhere in Italy as a surgeon with a tank battalion, received the Silver Star award for "devotion to duty." The citation accompanying the award read as follows: "For professional work and an excellent job in preoperative and post-operative cases, treatment, shock therapy and unstinting devotion to duty without regard for fatigue and loss of sleep. It is difficult to see how this officer got any sleep or rest for the first four days. The chiefs of the surgical teams wish to convey to you their sincere thanks and appreciation for the cooperation and help accorded in all respects during a trying period." Dr. Vare graduated from Columbia University College of Physicians and Surgeons in 1941. He was ordered to active duty on July 1, 1942 and was trained at Carlisle Barracks, Pennsylvania, and Camp Edwards, Massachusetts, before being sent overseas last April.

LIEUT. COL. JOHN M. SNYDER AWARDED LEGION OF MERIT

The War Department announced recently an award of the Legion of Merit to Lieut. Col. John M. Snyder, formerly of Slatington, Pa., for "exceptionally meritorious conduct in the performance of outstanding services from March 19 to April 8, 1943. On many occasions Lieutenant Colonel Snyder, chief of surgical service, worked unceasingly at the operating table until exhausted and then after only two hours of rest would continue his duties. The fidelity to his task and the calm and tenacious manner in which he performed his duties were a fine example and an inspiration to all with whom he came in contact. Lieutenant Colonel Snyder's performance of duties exemplifies the highest traditions of military service." Dr. Snyder graduated from the University of Pennsylvania School of Medicine, Philadelphia, in 1934 and entered the service March 12, 1941.

TWELFTH CLASS OF AVIATION PHYSIOLOGISTS

Graduation exercises at the School of Aviation Medicine, Randolph Field, Texas, for the twelfth class of Aviation Physiologists was held November 27. The course in aviation physiology is of five weeks' duration and treats of the effects of flight on man, the operation of low pressure chambers, the theory and practical use of oxygen equipment and the conduct of high altitude indoctrination and classification. Brig. Gen. Eugen G. Reinartz, U. S. Army, is commandant of the school. Among those graduating were 1st Lieut. Joseph H. Holmes, New York, and 1st Lieut. Jacob M. Werle, Cleveland, of the medical corps.

FAMOUS FOOTBALL COACH NOW STUDENT AT MEDICAL FIELD SERVICE SCHOOL

Major Edward N. Anderson, former head football coach at the University of Iowa, is a student officer at the Medical Field Service School, Carlisle Barracks, Pennsylvania, where in a six weeks course he will be taught the military knowledge necessary for him to be an efficient officer, capable of carrying out medical preventive measures and caring for the sick and wounded under war conditions. Although a physician by profession, Dr. Anderson has played and taught football for nearly two decades. He is a graduate of Rush Medical College, Chicago, 1929. During the off seasons Dr. Anderson has followed his medical profession and has done considerable research work in the interest of medicine. He received his commission in February 1943.

CAPT. MARY C. WALKER TO SUPER- VISE CADET NURSES

Capt. Mary C. Walker, Army Nurse Corps, former assistant director of the Colorado State Board of Nurse Examiners, has been named to supervise U. S. Cadet Nurses entering army hospitals for six months' affiliation and training. Under the training and orientation program, in which approximately thirty army hospitals will participate, the students, all senior cadets, voluntarily take the six months army course, after which they assume either civilian or military nursing duties. While taking the army course they will be provided by Captain Walker with qualified army nurses as educational directors and clinical instructors. Every ten senior cadets affiliated with the army can relieve eight army nurses for overseas duty, Captain Walker explained.

TREATMENT OF VENEREAL DISEASE IN ARMY HOSPITALS

The treatment of venereal disease in army hospitals was recently discussed in Circular Letter No. 195, issued December 1 by the Office of the Surgeon General. Regardless of the specific type of venereal disease, the hospital management of patients with venereal disease ordinarily entails the use of diagnostic, epidemiologic and administrative procedures which are similar. In order to insure that these functions are well coordinated, the organizational charts for station and general hospitals will provide for a Venereal Disease Section. Since ordinarily each of the venereal diseases is now effectively treated by internal medication, making surgical or manipulative procedures rarely necessary, the Venereal Disease Section should be organized as a unit of the medical rather than the surgical service. In hospitals under construction and subsequently authorized, the staff organization will conform initially to this policy; in existing hospitals where the Venereal Disease Section is not already a unit of the medical service it will be transferred thereto unless, because of local conditions, such transfer would clearly be prejudicial to the most efficient care of patients with venereal disease.

FIRST WOMEN DOCTORS GO THROUGH TRAINING

The Army's first women doctors are going through their indoctrination and training at Lawson General Hospital, Atlanta, Ga., prior to their assignment to fixed medical installations. Ten doctors are in the four weeks course learning army medical procedure and administration. At the completion of the course they will replace male doctors for overseas service.

PROCUREMENT AND ASSIGNMENT SERVICE FOR PHYSICIANS, DENTISTS AND VETERINARIANS

INTERNSHIPS AND RESIDENCIES

The Directing Board of the Procurement and Assignment Service for Physicians, Dentists and Veterinarians issued Form No. 317, dated December 22, to the state chairman for physicians, which is concerned with the approval by state boards of licensure of nine months' internship. The Federation of States Boards of Medical Licensure communicated with all states requiring the prerequisite of an internship for licensure to practice medicine. Every state and territory approved the nine months internship for commissioned officers, accepting either general military service or service in a military hospital of three months to make up for the entire internship of a year. A number of states did not approve the nine months internship for persons ineligible for military service. All interns not going to the service, therefore, should be told to serve an additional period of nine months as a junior resident, so as to qualify for the minimum internship requirements of some states. This is a means by which more physically disqualified men may be encouraged to take residencies.

RELOCATING PHYSICIANS AND DENTISTS DISCHARGED FROM THE ARMY

Arrangements for the relocation of physicians and dentists discharged from the army are explained in Form No. 316 recently issued by the Directing Board of the Procurement and Assignment Service for Physicians, Dentists and Veterinarians. The Veterans Employment Service, a division of the War Manpower Commission's Bureau of Placement, has a field staff which spends a considerable part of its time in hospitals from which soldiers are discharged in order to facilitate their return to civilian life. This field staff has now been instructed to work closely with the Procurement and Assignment Service in assisting discharged physicians and dentists to return to private practice. It is hoped that, as a result of this joint effort, physicians and dentists may be directed to critical areas and to other

places where they can free men for military service who are now essential to their communities. The names of physicians and dentists approved for discharge will be furnished the Veterans Employment Service field staff by the army officials at hospitals from which discharges from service are made. The field staff will interview these physicians and dentists and will give the central office the following information for forwarding to the state chairmen:

1. Name, specifying whether M.D. or D.D.S.
2. Address of former place of practice or position, if any.
3. Address of contemplated place of practice, if definite decision has been made.
4. Type of practice.
5. State in which he is licensed to practice.
6. Exact date of discharge, if possible, or approximate date of discharge.
7. Address where he may be reached the following ten days.
8. Opinion of the individual as to when he will be able to practice.
9. Opinion, if possible, of the medical officer in the hospital as to the physical and mental condition of the individual, and when he will be able to undertake the practice of medicine or dentistry. (This information, of course, will be kept strictly confidential.)

Those persons who know where they intend to practice will be instructed to get in touch with the state chairman so that he may be informed. Procedures for effecting the relocation of other persons who have not made a definite decision have not yet been completely worked out. Methods for solving the many problems involved in returning veteran physicians and dentists to civil life will have to be worked out as the program develops. The Procurement and Assignment Service, however, has a definite responsibility to these veterans, as well as a continuing responsibility for furnishing physicians to the armed forces, having due regard for the medical needs of the civilian population.

MISCELLANEOUS

WARTIME GRADUATE MEDICAL MEETINGS

An extensive schedule of courses of instruction under the auspices of the Wartime Graduate Medical Meetings in Region 3 in New York has just been announced. The regional committee consists of Dr. Oswald R. Jones, Dr. Norman Jolliffe and Dr. Henry W. Cave. The schedule of courses at the Grand Central Palace, 480 Lexington Avenue, New York, is as follows:

January 14, Dr. Elbert Vander Veer, The More Frequent Allergies.
January 21 (repeated January 28), Dr. Harold E. B. Pardee, Significance of Normal and Abnormal Electric Cardiographic Tracings.
February 4 (repeated February 11), Dr. Algernon B. Reese, External Diseases of the Eye and Glaucoma.
February 18 (repeated February 25), Dr. William P. Thompson, Simple Laboratory Procedures.
March 3 (repeated March 10), Dr. Alan DeForest Smith, Foot Strain.
March 17 (repeated March 24), Dr. George C. Andrews, Common Skin Diseases in Soldiers.
March 31 (repeated April 7), Dr. A. Wilbur Duryee, Peripheral Vascular Disease.
April 14 (repeated April 21), Dr. John F. Erdmann, General Surgical Approach to the Abdomen.
April 28 (repeated May 5), Dr. Arthur Krida, Disorders of the Low Back.
May 12 (repeated May 19), Col. Douglas T. Thom, Neuropsychiatric Problems in the Army.

The schedule of courses to be given at Camp Shanks, Orangeburg, N. Y., is as follows:

January 13, Dr. Arthur H. Fishberg, Nephritis.
January 20, Dr. John B. Dunnington, Medical Ophthalmology.
January 27, Dr. George C. Andrews, Common Skin Diseases in Soldiers.
February 3, Dr. Byron Stookey, Low Back Pain and Sciatic Syndrome: Discussion of Causes and Treatment.
February 10, Dr. A. Benson Cannon, Syphilis.
February 17, Dr. J. Burns Amberson, Sequela of Acute Pulmonary Conditions.
February 24, Dr. C. Cary Eggleston, Rheumatic Cardiac Disease, Diagnosis and Treatment.
March 2, Not announced.
March 9, Dr. Robert Loeb, Present Status of Human Serum Albumin and Plasma.
March 16, Not announced.
March 23, Dr. Herbert Chasis, Hypertension.
March 30, Not announced.
April 6, Dr. Frank L. Meleney, Surgical Bacteriology in the Treatment of Surgical Infections.
April 13, Dr. Walsh McDermott, Present Status of Use of Sulfonamides in Surgery and Medicine.
April 20, Dr. Emery A. Rovenstine, Anesthesia.
April 27, Col. William C. Porter, Neuropsychiatric Problems in the Army.

On January 6 Dr. Dana Atchley gave the first lecture in this series on Medical Shock.

CHIEF MEDICAL OFFICER OF PHYSICAL REHABILITATION

Mr. Paul V. McNutt, federal security administrator, recently announced the assignment of Dr. Dean A. Clark, surgeon, U. S. Public Health Service, as chief medical officer of the Office of Vocational Rehabilitation to take charge of the newly established Physical Rehabilitation Section. In commenting on Dr. Clark's appointment, Mr. Michael J. Shortley, director of vocational rehabilitation, said that the use of federal funds for remedial medical treatment of the physically handicapped was authorized for the first time under the Barden-LaFollette act of July 6, 1943. He explained that the new vocational rehabilitation program will make an important contribution to the war effort by facilitating the employment of the physically handicapped and thus promote effective use of manpower for war work. The rehabilitation program is designed to assist all physically handicapped individuals to obtain remunerative employment, except veterans with service connected disabilities, who come under the program directed by the Veterans Administration. The program is operated by the states through their boards of vocational education and their official agencies for the blind.

As a war measure the federal government pays the full cost of rehabilitating war disabled civilians. These include officers and crew members incapacitated while on war duty in the merchant marine and members of the Aircraft Warning Service, Civil Air Patrol and U. S. Citizens Defense Corps.

The federal government pays half the cost of rehabilitation for other individuals. All administrative expenses of the states in conducting approved rehabilitation programs are also met with federal funds. Under the new statute, federal aid may be utilized to provide all types of medical and surgical services necessary to modify a physical condition which is static and which constitutes a substantial handicap to employment. Conditions for which medical services are undertaken must, however, be of such a nature that treatment may be expected to eliminate or substantially reduce them within a reasonable length of time. Hospitalization not to exceed ninety days may also be furnished as well as prosthetic appliances essential for obtaining or retaining employment.

Dr. Clark graduated from Johns Hopkins University School of Medicine, Baltimore, in 1932.

CHILEAN ARMY DOCTORS INSPECT NATIONAL NAVAL MEDICAL CENTER

Two Chilean army doctors, Col. Flavio Meza Olva, prospective surgeon general of the Chilean army, and Major Ramon Vicuna Herboso, surgeon attached to the army headquarters, recently completed a tour of inspection of the Naval Medical Center, Bethesda, Md., and the Army Medical Center, Washington, D. C., during which Dr. Vicuna contributed his blood for the American armed forces "as a symbol of amity between the army of Chile toward the American army." Dr. Meza was formerly professor of medicine at the University of Chile, and Dr. Vicuna is now professor of medicine. The two medical officers arrived in this country December 5 on a medical mission sponsored by the Coordinator of Inter-American Affairs. They will study military medicine and civilian teaching methods in various sections of the United States.

PUBLIC HEALTH UNDER HITLER

Psyche Paychev reports in *Slovo* (Bulgaria) of Oct. 1, 1943 that the state of hygiene in restaurants and other food producing establishments is deplorable. After stressing the need for more cleanliness, he writes: "One must acknowledge that, owing to the nonexistence of continuous and strict sanitary supervision, the reality is very dark. Everybody who has occasion to enter the kitchens of restaurants and hotels and of shops where sweets, milk or bread are produced or where food is canned will be bewildered and disgusted by the dirt and lack of hygiene reigning there. In most of such concerns, kitchen workers are disgustingly dirty, awful to look at, and wear no overalls. Copper vessels have not been tinned, and all vessels are extremely dirty. The food is always covered with flies and creeping insects. I leave it to the imagination of the readers to decide what the products are like. In certain shops the tablecloths and towels are dirtier than the puttees of soldiers in the front line. What we have just said is not a myth but reality itself which may be checked at any moment. That is why we ask for stricter sanitary control."

According to *Novo Vreme* (Yugoslavia) of Oct. 1, 1943 the state of contagious diseases in Belgrade during the last month shows certain changes: The influx of typhus still continues. The number of reported cases of typhus last month is 7, which is the same as the month before last. Typhoid shows a seasonal increase, that is to say there are 25 new cases against 13 for the month before last. Scarlet fever shows an increase, always in the beginning of the school year, but there are no serious cases. Diphtheria has also increased, with 87 cases compared with 58 in August. All schools and children's organizations have received orders to take the most energetic countermeasures in connection with this increase. Malaria, as the chief seasonal illness, shows a pronounced decrease; in September there were 415 cases recorded, as compared with 999 in the previous month. Antimalarial activity, which gave such good results in August, has been continued, but on a somewhat reduced scale. A large number of springs have been chlorinated.

ORGANIZATION SECTION

OFFICIAL NOTES

ANNUAL CONFERENCE OF SECRETARIES AND EDITORS OF CONSTITUENT STATE MEDICAL ASSOCIATIONS

FRIDAY, NOVEMBER 19—MORNING

Dr. Roger I. Lee, Chairman of the Board of Trustees of the American Medical Association, welcomed the conference.

Dr. John S. Bouslog of Denver was elected chairman.

Address by Dr. James E. Paullin, President of the American Medical Association

During the past ten or twelve years it has been my pleasure to have been intimately associated with the activities of the office of the American Medical Association here in Chicago. I think some of us, unfortunately, get the idea that the headquarters office is an institution which is set apart from the state associations, whereas it is your office, and it is conducted according to the policies and instructions given to it by the House of Delegates of the American Medical Association. The headquarters office makes every effort to carry out the policies which have been determined for it to follow.

At this time I should like to bear witness to the faithfulness with which the Board of Trustees handles the affairs of the Association. During the past two years it has been my pleasure to meet with them on many occasions, and I have never seen a group of men more earnest and who have devoted more attention to the business of the association.

What I say concerning the Board of Trustees is true for every member of the councils and bureaus in this organization. All of you are familiar with the efforts of two of our staff, in particular, who really supply the inspiration for the activities of the headquarters force. No words of praise are too many to be given to the untiring, unselfish work of Drs. Olin West and Morris Fishbein.

During the past year the Association has been extremely active in attempting to look into the future concerning many problems that face us. The House of Delegates directed that the Wartime Graduate Medical Training Program should be instituted as a part of the activities of the American Medical Association, in cooperation with the American College of Surgeons and the American College of Physicians. The accomplishments of this committee, with the help of a long list of honorary consultants drawn from civilian practice and from the military service, in making available the latest developments of scientific medicine to physicians in military and civilian practice throughout the United States, is a record of which we are proud. The appreciation with which these programs have been received by all is a tribute to the foresightedness and to the planning of the House of Delegates, in making possible this contribution of American Medicine in the fulfillment of our desire to be of greater helpfulness in stimulating an interest for postgraduate teaching among military and civilian physicians.

The Postwar Planning Committee has held several meetings. There are problems which have been discussed by this group which should be of interest to you; first, problems that directly concern us in this country; second, problems which will concern us after the war is over, in our relationship to the countries of our allies.

One of the problems about which there is much discussion is that of supplying physicians to meet civilian needs for medical care. With the adoption of the accelerated medical training program by the Army and Navy, in which there will be allotted about 20 per cent of the available places in medical schools for physicians to be used in supplying civilian needs (the 20 per cent to be composed of men deferred by Selective Service, those physically disqualified for military duty and women) it is evi-

dent that under the most favorable circumstances this would give only about 1,200 graduates each twelve months to meet the demand. If conditions remain as they are now, with no change in the mortality rate of doctors over 40 years of age who are engaged in civilian medical practice, there will be an annual deficit of nearly 2,000 physicians. It isn't believed that the 1,200 graduates each year allotted to civilian medical care can be placed in this essential capacity. Of the women graduates some will undoubtedly join the Army or Navy, and industry will claim many others. Should the war last beyond 1945 this shortage will become a very serious problem, even though many of the physicians discharged from the military service will enter private practice. This will not be sufficient to meet the deficit caused by deaths and retirement.

Another problem which concerns us is that of providing for the 20,000 physicians who will be anxious to begin the practice of medicine when the war ends. Of this number some have never engaged in the private practice of medicine; some entered the military service after a brief nine months internship, others after a longer period of training either as a resident or as a fellow. A postwar planning group, utilizing the facilities of the Council on Medical Education and Hospitals, the Bureau of Medical Economics of the American Medical Association, together with the Procurement and Assignment Service, in cooperation with state and county medical societies can be most helpful in organizing a program for the better distribution of physicians into areas where they are most needed and in making suggestions to communities which would make many of them more attractive to the well trained young physician to begin the practice of medicine.

Many of the younger men returning from military service will feel the need of additional training or instruction before undertaking medical practice. Some will desire refresher courses to equip them for general practice; others will want a longer period of training and some may wish, in addition, to take postgraduate training or special long term training to qualify for one of the specialties. The Postwar Planning Committee has attempted to anticipate many of these needs, and subcommittees are studying many of the problems preparatory to offering suggestions for their thoughtful solution. This may necessitate the establishment of a clearing house, so to speak, where information concerning these problems will be readily available.

Many state medical associations have already appointed a postwar planning committee to formulate plans for solving of their local problems. As the war advances and as civilian and military medical needs become more acute, there will be greater need for this type of service. To the secretaries of the state societies I wish to direct attention particularly to the needs of the rural population and to request that their needs be studied and a plan of action formulated which will be helpful in supplying them with much needed medical care.

The average graduate of our medical schools today is so well trained that unless clinical laboratory, x-ray, electrocardiographic and hospital facilities for the care of his patients are available to him in a given locality he naturally will seek some other place where these facilities are obtainable. Needs such as this must be considered and solved by each state; the natural organizations to be utilized either in a coordinating or consultative capacity. The location or the relocating of many physicians after the war is over will continue to be one of our chief problems. We, as a profession, can supply the personnel to furnish good medical care, but there are other problems involved in such a procedure in which other groups can be most helpful in supplying facilities.

Finally, I do not come to you with a completed program or with a correct solution for the many problems which will arise in this postwar medical world. I do not know of any one of several methods of procedure which will satisfactorily solve all of these questions, but I do know that we, as a profession, have

devoted and will continue to devote our best efforts to solve our part of this problem. It can best be accomplished through a cooperative effort of county, state and our national medical association and with other agencies interested in postwar problems.

Problems Relating to Assignment of Duties of Military Surgeons

MAJOR GENERAL GEORGE F. LULL, Deputy Surgeon General, United States Army: When the war started we had 1,250 medical officers. If any business expands 100 per cent it is considered that it has had an enormous expansion. We expanded from 1,250 to 40,000. It took place over a period of two or three years. At one time the rapidity of the expansion was enormous. We have discharged, in the last two weeks period, more doctors than we have taken into the Army, so we are not expanding so rapidly now. These men have had to do jobs many of which were similar to the ones they did in civil life, and others altogether different from what they did in civil life. They had to do military medicine. Military medicine is not just putting a uniform on a doctor and putting him to work. Even in a hospital in the interior zone there are certain things he has to do that are different from those he does in civil life. The basic treatment of the sick is the same all over, but there are certain other functions that he has to perform in the Army which are entirely different.

The chief surgical consultant of the British army from North Africa has stated certain principles. "The following points were made in General O'Gilvie's lectures here in this country: 'There are four things that any surgeon, however brilliant and however experienced he may be, must learn afresh when he enters the theater of war: 1. Military surgery is not just traumatic surgery in uniform, but part of the science of warfare. 2. The clinical picture of a wound has to be learned afresh, just like the symptoms and signs of appendicitis. 3. No surgical procedure in war is complete but is a part of a process whose preceding and subsequent steps must be taken into account. 4. The teachings of the last war, which still dominate articles in textbooks, are not applicable today.'" These impressed General O'Gilvie in the practice of surgery in the theater of operations.

When we started to take in physicians who were supplied to us by either the voluntary service system or through the Procurement and Assignment Service, many desired a specific assignment. They wanted to go to Fort X to do x-ray work at Fort X. We told them that we might give them an initial assignment at Fort X to do x-ray work provided there was a vacancy, but after they were originally assigned we had no way of continuing them at Fort X. They would be sent to the place where their services were needed the most, and they would be assigned to do the work that was needed most.

For scarce categories of specialists we have no complaints. We have always been a little behind with the procurement of x-ray specialists; therefore every man who knows anything about x-rays, I believe, is assigned to x-ray work.

There are other specialties for which it is rather difficult to make assignments. Pediatricians, for instance, gynecologists, obstetricians and to a certain extent ophthalmologists and otolaryngologists are difficult to assign.

I believe that this postwar planning which is being sponsored by the American Medical Association is a wonderful project. We should have a plan to take care of these men after they come back from the Army and Navy. However, I believe the problem is not going to be as difficult as we think. A large percentage of these men are going right back to the job and to the place from which they came. As Dr. Paullin has said, the men who have recently graduated in medicine comprise the group we have to take care of particularly. But don't think for a minute that these men aren't learning something in the Army, no matter if they are out with a tactical unit. These men are learning something that they would not learn in a peacetime hospital, nor would they learn it in the practice of medicine until they had been out a long time. Self reliance, working with what they have to work with, having a lot of people dependent on them absolutely for medical care, both the prevention of disease and for the primary institution of treatment, are things they are being taught today.

I talked a short time ago to a man who had just come back from the southwest Pacific. On the particular island we landed at two points. One battalion of infantry landed on a beach, and their objective was to take a certain hill dominated by the Japanese and containing a large number of pillboxes armed with machine guns. The other force was to keep contact with them along the side and come up on the flank of the hill. They became separated in the jungle, and the Japanese on the hill thought that only the small force was coming up the hill, so they left the pillboxes and came down to whip them. That is where they made a mistake. But they did cut our men off from the main body. A shell exploding near a soldier didn't blow his arm off, but it destroyed his forearm, which was crushed and useless; it could not be saved. The young doctor with the battalion had no instruments except a pocket instrument case. He had some ether and some alcohol, so he got his assistant to anesthetize the patient. He put some alcohol in a ration can, lighted it and sterilized a small medical department hand ax. He fixed a frame board and chopped the arm off, covered it with sulfanilamide powder and during the course of the two days gave the patient six transfusions of blood plasma. The man is back in the United States now, he has had his stump repaired, and he is going to live and get along all right. This doctor had been out of an internship only a few months. He went overseas with an affiliated unit as the junior officer in the unit, and he volunteered to go with that party to that island. That boy has learned a lot, and he is only one of many. He has had the courage of his convictions.

We have had letters from your members in which they complain that they have nothing to do. Well, sometimes they have nothing to do because they don't see what they have to do. In the training period in the United States these men are supposed to be training their assistants and their enlisted men to be valuable assistants in time of combat. They have to be ready for the time when combat comes, and this preparation has to be done before they reach the theater of operations.

Many things have to be considered and decided by the senior medical officer with any unit, even if it is a battalion. Where will he establish his battalion and general aid station? Where will he establish it so the soldier will get prompt care and have his life saved? He has to establish that aid station at the nearest possible place back of the line where there is some slight protection and where the soldier can be sent immediately.

The type of warfare they are waging in the Pacific area is altogether different from the type being waged in North Africa. They are two different types of warfare. What the doctor has to do in one place is entirely different from what he does in the other place. The doctor in North Africa, on account of the great mobility of the front lines, might find himself with more German wounded than American wounded, while the American wounded are in the hands of the Germans, because the lines bend back and forth over great stretches of country. It is different in the Southwest Pacific, where the men land on an island where a bulldozer has to make a trail before troops can go ahead, because if they get through the jungle they have no way of bringing up supplies. Climatic conditions are different.

We have one great enemy in both places—malaria. That has been stressed both in the press and in the medical journals, because malaria is something that we must fight just as hard as we have to fight the Japanese or the Germans. It does not kill except a relatively small number of persons, but it does put them out of combat, which is just as important as if they were killed outright.

I think we have a splendid representation of American medicine in the Army. The American soldier as a whole is getting better medical care than he got at home, because many of our boys came from rural areas where the standard of medical care, as Dr. Paullin said, is not the best, because doctors do not like to go to those areas. Our boys are getting a high type of medical care.

One of the first principles is to get the wounded man back to a hospital. In some places this is very difficult to do, and in the Southwest Pacific at times it takes eight litter bearers to carry one man. They have to go in relays over trails and through the jungles. In North Africa sometimes they can be evacuated by airplane direct to a hospital in very short order.

There are a number of things that have cut down our mortality in these advance hospitals. In Tunisia the mortality was between 2.5 and 5 per cent in the advance hospitals. That is a reduction from World War I figures of from 9 to 12 per cent, depending on the action. This is due to a number of things, and it means that if the wounded soldier is taken back promptly his chances of recovery are better than ever before.

I said before that we lost, in the last two weeks, more doctors than we have gained. That is very true. If you read the death notices in *THE JOURNAL* you will see that black box at the end of the death notices. That contains always a number of names of men who died in the military and naval service. A great many of them are killed in airplane accidents. Then we have men who cannot keep up. We took in medical men and lowered the medical standards and waived many disabilities in medical men who were anxious to get into the service. They are being let out now, a few of them at a time, because they simply can't stand the gaff, and each month they amount to a considerable number.

We feel that the medical profession now is divided up in the country about as follows: There are the men in the military and naval services. Second, there are the men who are too old or who are physically disqualified—a large group. Third, there are the men who are essential to civilian life, especially in teaching institutions. Fourth, there is still a group who are nonessential in civil life but who have no desire to enter the military and naval service.

I say this, and I believe I shall be borne out by the Procurement and Assignment Service, which has carefully combed each state for men who are available and who are not available: The voluntary system of recruiting medical officers is over. There are no more volunteers in the United States, except among the group who should not be allowed to volunteer. We will all agree on that. It does not mean that the men who want to come in are all in; there are many men who desire to enter the Army and Navy who should not be allowed to enter because their place is back home. In some places the numbers amount to more than others, relatively and absolutely. But we feel that we are through getting any more volunteers.

We are short many specialists. We have to form a number of hospitals to go overseas, and we are short a great many of the specialists needed to put in those hospitals; that is, the men who have the right training. We can get men who have had partial training, but we feel that the hospitals going out in the next six or eight months will not go out as well equipped, as far as personnel is concerned, as the hospitals that have previously been sent out. This will mean that the theater surgeon may have to make certain adjustments between the hospitals he already has and the ones he is getting, in order to balance the staffs, and it means that all in all the staffs will not be quite as good as they were formerly.

DISCUSSION

DR. HAROLD S. DIEHL, Minneapolis: General Lull, I wish you would comment further on the need of the Army for additional medical officers. From your statement about the stabilization of the medical corps, I think one might conclude that the Army's needs have been met, while, as you know, the Procurement and Assignment Service is receiving exceedingly urgent appeals from both the Army and the Navy for some 12,000 more medical officers.

GENERAL LULL: I did not mean to convey that impression at all. I meant that we were through as far as we were able to get volunteers. The Army needs now, in addition to the men graduating who act as replacements, about 5,000 to 7,000 more doctors. We had a program in which the doctor was placed in a table of organization or an allotment so that it called for about 62,000 medical officers. We saw we could not get them from civil life, that this was impossible. So we tore the table down and felt that if we could get 48,000 or 49,000 doctors we could get along and give the soldier excellent medical care. When we fall below that the care will not be quite as good, but that is something we simply have to make the best of. It means that one doctor will look after a great many more patients. He cannot give them the individual attention that he could give if we had fewer patients, and we can get along with that number, we feel; but we haven't got

that number. I believe the last figures we had showed a rough figure of about 40,000. It isn't because the Procurement and Assignment Service has fallen down on the job of picking them out—it picks them out all right and gives us the names. It turns over to the Office of Procurement Service those names, but then the procedure bogs down. Even when the doctor has signed and mailed his questionnaire, saying he desires to enter the Army first and the Navy second choice, even if he sends that questionnaire in, we have found a good many hundreds of them who absolutely refuse to sign up when the time comes.

DR. STANLEY B. WELD, Hartford, Conn.: Is there any hope that Selective Service will help out the situation at all, especially in the age group between 38 and 45? I believe in our state they are absolutely sitting on their haunches.

GENERAL LULL: I don't know whether they will or not. It all depends on the local board, of course. Some states have cooperated much better than others. When a man refuses to take a commission, his name is sent to the Selective Service. But usually when it gets down to the local board level there is some reason why he should not go into the service; perhaps he is needed in the community.

DR. PETER IRVING, New York: I should like to ask a question as to how the young men who have had only nine months of hospital training have turned out in the eyes of their commanding officers, and whether they have had enough hospital training to make them worth anything?

GENERAL LULL: We haven't enough to know. That is just starting, so we haven't been able to judge it as yet. You know what these men are going to get after the nine months of hospital training: They are not going out with troops right away. Probably half of them will be sent to big hospitals for six weeks, while the other half will go to Carlisle for six weeks of instruction; then they will be exchanged, so they will all get some hospital training.

DR. W. EDWIN BIRD, Wilmington, Del.: Is the Army taking men without state licenses?

GENERAL LULL: Recent graduates, yes. A man who has finished his medical school and his internship is taken without a state license; or if he is a graduate of an accredited school he is taken. We do not take the men who have been out a number of years and who have no state licenses. For instance, we have some cases where a man has been an intern, an assistant resident and a resident for three, four or five years and has never taken a state board examination. We take him if he has been in an accredited hospital.

DR. D. G. EDMUNDS, Salt Lake City: While the Procurement Board has done well, it has not furnished enough men. Do you think the state boards will be done away with and that the government will take over directly?

GENERAL LULL: It is not the fault of the Procurement and Assignment Service that it has not procured the men: it is the fault of the charter under which it operates. It operates under a set of rules whereby it can put the finger on a man, but that is as far as it can go. I do not think they should be done away with.

DR. MORRIS FISHBEIN, Chicago: Can you think of any suggestion that you can give the secretaries and editors as to how they could aid in securing men marked available by the Procurement and Assignment Service?

GENERAL LULL: Public opinion can be brought up locally much better than it can nationally. If there is some way that the finger of public opinion could be pointed toward those individuals it would be a big help to us and to the Procurement and Assignment Service.

DR. R. B. ANDERSON, Fort Worth, Texas: The statement has been made that the Procurement and Assignment Service is helpless in making some of these doctors enter service after they have been declared available. The Procurement and Assignment Service does have a whip and does have a compulsory feature with selective service that can be used for those who are within the age bracket of selective service. I am vice chairman for Procurement and Assignment in Texas. When one of our doctors in Texas is declared available for military service he is informed of it in a letter and is told that

he has been declared available. He is told the proper office of Procurement to which he should go to get his commission. At the same time he is told that we have a directive from the Washington office of Procurement and Assignment that requires our office to report his name to the state director of Selective Service if he does not seek the commission within a certain period. That has been agreed on as reasonable—sixty days. That letter gets results down in Texas.

GENERAL LULL: I think we have got our quota from Texas, too; haven't we?

DR. ANDERSON: We have supplied you with our quota and we have tried to find out how much over we were, because we don't want to fight the whole war.

DR. E. D. SHANKS, Atlanta, Ga.: What happens in Texas is also true in Georgia. Dr. Selman, who is here, is state chairman of Procurement and Assignment. I am a member of that committee. I am also secretary of the Medical Association of Georgia. We have had in our state the usual experiences in procuring doctors for the Army and Navy. We have had, as Dr. Lapham knows, some misunderstanding about some of these doctors. In the end public opinion prevails.

GENERAL LULL: In the smaller communities throughout the country public opinion is so close to the individual that it does have a fine effect. In the big cities the individual doctor is far removed from public opinion.

Hospital Training of Medical Graduates

DR. VICTOR JOHNSON, Secretary of the Council on Medical Education and Hospitals, Chicago: [Dr. Johnson traced the historical development of the Council on Medical Education from 1846 onward.] The permanent Council on Medical Education, established in 1904, reiterated a belief in the indispensability of hospital training. The Council early recognized that internship problems involve features different from those of the hospital training of undergraduates. An important factor is that most hospitals offering internships are removed from the direct influence of medical schools. It became clear that the development of adequate intern training required the Council to obtain better information about hospitals offering intern training. Although in 1913 no medical school or state examining board required the internship for the degree or for licensure (Pennsylvania was the first state to require the internship for licensure [1914] and the University of Minnesota was the first school to require the internship for the M.D. degree [1915]) 70 per cent of the graduates took internships voluntarily at that time. This student recognition of the value of hospital training, supplemented of course by advice from medical schools and physicians, was and still is a more potent factor in inducing students to intern than is regulation through law and degree requirements. At the present time twenty-six states require no internship for licensure, and sixty of the sixty-six four year medical schools do not require this for the M.D. degree. Yet virtually every medical student takes such training.

In approving hospital residencies for training in the specialties, the Council collaborates closely with the various specialty boards. These "American boards," of which there are now sixteen, have been organized by various national societies of specialists in conformity with the Council's Essentials of an Approved Specialty Examining Board. Annual lists of approved residencies, internships and fellowships are prepared. In addition to 1,161 hospitals approved for internships, residencies and fellowships, the Council likewise maintains a hospital register of 6,345 hospitals which, although not approved for internships and residencies, measure up to standards of medical service as set forth in the Council's Essentials of a Registered Hospital. Before considering a hospital for membership, the American College of Surgeons and the American Hospital Association require inclusion of the hospital on the American Medical Association's list of registered hospitals.

Conventionally, the training of the medical student has been divided into three units: two preclinical years, two clinical years and one intern year. A notable trend, extending over many years, has been the erasure of these artificial time delimitations. Clinical material is being introduced into the first years in medical school, vitalizing basic science subject matter

and lending meaning to much that might otherwise seem purely academic. Basic science material is infiltrating itself into the clinical years and increasing their value, with physiology conferences on clinical problems, scientific bacteriology studies on infectious disease patients and the like. Similarly the transition from the senior year of medicine to the internship is becoming less and less abrupt. Through the years there has been a change from clinical work, in which medical students sat in large classes and listened or spent long hours trailing through hospital wards on rounds, to the present system of clinical clerkships, in which the medical student has definite responsibilities as an important member of a hospital team including laboratory technicians, nurses, house staff and attending physicians. The student is on call day and night and often is the first to get the history, make the examination and do the necessary routine laboratory procedures. In some schools selected senior medical students live in the hospital as student interns with responsibilities far beyond those of the medical student of years ago while still subject to close supervision and careful checking.

Wartime acceleration has affected education in all fields of learning and in all stages of the education of a doctor. A serious responsibility rests with every one who has been concerned with the long years of training required for the professions, especially medicine, to evaluate carefully these wartime programs, with a view to retaining after the war those features of acceleration promising to improve our educational program and reduce the training period, consistent with quality.

Of the various accelerated programs, that of the regular undergraduate medical curriculum is perhaps the most likely to justify its permanent retention, perhaps in modified form. The only change is the elimination of the long summer recess. It is not clear why a medical student should be able to do good work for only three fourths of the year and why he requires twelve or more weeks each year away from his job. There is no apparent justification for requiring a student to spend an extra nine months or a year in medical school necessitated by the long vacation periods, which annually waste 5,000 physician years. Immediately on graduation the student will embark on a work program in his internship and residencies in which he will rarely have more than two weeks of respite from work. This will probably continue throughout a lifetime in the practice of medicine. There seems to be no good reason why a student, on graduation, should suddenly cease to require a three months diversion from medicine and abruptly become an individual requiring but two weeks. The accelerated program can allow vacation periods totaling four or five weeks.

I do not propose to discuss all the pros and cons of medical school acceleration except to state that any reduction in educational standards which may have occurred under our wartime program is due far more to several other factors than to acceleration itself. The premedical programs are accelerated not only by employing practically the entire calendar year for instruction but by greatly increasing the quantity of work done by the student per day or week. Whether students can successfully carry this load remains to be determined when the programs have been in full operation for a time. Serious doubts about the quality and breadth of the preparation of premedical students have been expressed. It is highly probable that the degree of acceleration involved in the Army and Navy programs will not and should not be continued after the war. The most recent acceleration—that of reduction of the internship to nine months, with three months in the service considered also as an internship, must clearly be considered a wartime emergency necessity which should be discontinued at the earliest possible moment. This plan, unlike both premedical and medical programs, decreases both the total duration and the quantity of training of a vital part of the education of a doctor.

Adoption of the plan resulted from these important considerations: (1) The periods of overlapping internships caused by the graduation of medical students every nine months instead of annually wasted medical manpower, and (2) the 9-9-9 program was the only method of deferment of commissioned officers as assistant residents and residents that the surgeons general of the Army and Navy would approve. An educational war casualty, the nine months internship has nothing to commend its continuation beyond the emergency period.

It is anomalous that at this time, when our hospitals are impoverished of interns, we must give serious consideration to provisions for a plethora of house officers. This will occur after the war. There will be thousands of medical officers whose hospital training has been interrupted who will seek continuation of their house officerships. Besides providing training for new generations of medical graduates, we are obligated to find opportunities for these medical officers to continue their training.

The Council on Medical Education and Hospitals has undertaken a study of this problem as one of its major responsibilities. In a preliminary survey information has been obtained regarding postwar residencies, basic science instruction, public health education and other postgraduate courses from 641 hospitals, 55 medical schools, 25 departments of health, 23 state medical associations and 15 special societies and examining boards. Information obtained, although incomplete, is most encouraging. Under normal conditions the 660 civilian hospitals approved for residency training supply facilities for approximately 5,500 resident physicians. The present survey reports 8,028 residencies in 545 hospitals. It is apparent that many institutions have almost doubled their educational capacity for postwar training. If this degree of expansion is maintained, it should be possible to develop 12 or 13 thousand residencies in the approved hospitals, especially if the potentialities of the internship hospitals are also taken into consideration.

Just how many medical officers will be seeking advanced training after the war cannot be determined at this stage, for there are still many unknown quantities as regards the duration of hostilities, casualties among medical personnel, rate of demobilization, opportunities for permanent assignment in the Army and Navy, postwar subsidies and other economic factors. It has been estimated, however, that approximately 12,000 graduates of recent years are now serving in the armed forces whose previous training in civilian hospitals did not extend beyond the intern year. Perhaps 6,000 of this group will later seek hospital appointment. In addition there is the possibility that some 2,000 former residents may return to complete their final assignments or establish themselves in other specialties. With a normal civilian complement of 5,500 residents the approved hospitals may also be called on to furnish 8,000 additional residencies in the immediate postwar period.

There is evidence in the reports of the medical schools that careful attention is also being given to the problem of supplying basic medical science instruction in the postwar period. Up to the present time 37 schools have indicated that facilities will be available for continued training in the preclinical fields. Twelve hospitals reported affiliations with medical schools to provide supplementary instruction in basic sciences, while 24 others indicated that courses of this type would be developed in their own departments of bacteriology and pathology. From the information now at hand it is apparent that 117 positions are available in anatomy, 124 in bacteriology, 135 in pathology, 96 in biochemistry and 123 in physiology. Information received from 60 hospitals, 26 medical schools and the various state medical associations and departments of health indicates that 259 postgraduate courses have been organized which can accommodate at least 4,522 physicians. This study will be continued, so that at the close of the war we hope to have available a printed list of all educational opportunities available to returning medical officers and especially planned for them.

DISCUSSION

DR. G. LOMBARD KELLY, Augusta, Ga.: Has any thought been given to increasing the length of the medical course? I have thought it might be possible, after the war, to lengthen the school year to ten months. I see you are in favor of an accelerated program. I do agree with you that three and one-half months is quite a waste of time in the summer. I would like to suggest consideration of a ten months session, four years of ten months each, with July and August omitted. I should like to know what you think of that.

DR. JOHNSON: Your suggestion is an increase in the school year but no reduction in the number of years; in other words, four years of ten months each, with an inclusion of much more into the undergraduate curriculum. I think one could justify increasing the curriculum in terms of total weeks spent in

medical school on the basis of accumulating new information which should be available to medical students, but you can also advance the argument that the medical course ought to be extended for five, six or seven years, using exactly the same arguments, and of course it is a question of just where to draw the line and exactly how much material students ought to get in the medical school, which of course is their beginning of learning about medicine. I would not favor increasing the total weeks in medical school, in laboratories and in lecture rooms. We can greatly increase the effectiveness of the time that is spent in our medical schools by a more careful planning of the content of the curriculum.

SECOND SESSION, FRIDAY AFTERNOON

DR. JOHN S. BOUSLOG, Denver, Presiding

Address of Dr. Herman L. Kretschmer, President-Elect of the American Medical Association

DR. KRETSCHMER: I find in my travels throughout the country a good deal of criticism, a good deal of fault finding, chiefly on the part of men who are not interested in organized medicine and who do not take a very active part. One hears that the American Medical Association does not do anything, that it stands still. I wish to disagree with that statement and to call to your attention just a few things that the American Medical Association has been doing over the past years.

Each day and each week new situations arise that must be met on the spur of the moment. Let me call your attention to the Postwar Planning Committee, the Council on Medical Service and Public Relations and the War Participation Committee. President Paullin this morning told you what his committee is doing and how farsighted it is in its plans for postwar medical service. Through action of the House of Delegates you have established a new Council on Public Relations and Medical Service. Men say to me "Why doesn't that committee do something," being totally unmindful of the fact that you can't appoint a committee by official action of the House of Delegates today and have that committee start to work tomorrow. This committee is represented by men in different fields of practice, from Maine to Florida and from Washington to California. I am sure, with the outstanding men on that committee, that they will be a credit to you and to the American Medical Association; but you will have to give them time to start. There is and has been for some time a drive for a permanent office in Washington and for the establishment of a public relations department in Washington. The public relations technic in medicine is entirely different from that for General Motors, Union Carbide or Bethlehem Steel. I believe the public relations of the Association are being handled perfectly. I have seen at close range this machine work.

It seems to me there is a good deal about public relations technic that we fail to appreciate. I have seen the public relations handled in this organization for a good many years, and I think those of you who may have some doubt in your minds about its workability and its efficiency might do well to discuss some phases of it with the people around this building. I certainly think it would be a mistake to have it run in any other way. I think the headquarters office here watches trends carefully, and the trends, as I said before, change from day to day and from week to week. The Association has been on the alert and has established various committees that are doing a splendid job to meet the situations as they arise.

I should like to say a few words regarding the Board of Trustees. I hear criticism of the Board of Trustees in my meandering through the country. I am not here to toot the horns of the members of the Board of Trustees. You as editors, and you as state secretaries, who have as one of your functions the dissemination of knowledge through your various journals, should be apprised of some of these facts so that when you return to your communities you may correct some of these misconceptions.

I have sat with the Board of Trustees for about twelve years and with the Executive Committee for the same length of time. The Board changes, as you know. Today there is not a single member on that board who was there when I first sat with it

in 1933. The Board has changed completely. Yesterday, as I looked over the Board of Trustees, I was greatly impressed by the fact that there is a general picture of the various types of practice. There are three or four internists on the Board, as rightfully there should be. There are three or four surgeons on the Board, which is fitting and proper. There is an obstetrician and a gynecologist; there is a pathologist, an eye, ear, nose and throat man. There happens to be a urologist. Not only are these men representatives of the various fields of practice but they represent various sections of the country. I am always impressed and always have been with the sincerity with which these men work and the great sacrifices that they make in traveling month in and month out to attend these meetings. They have only one objective. At heart they have the interests of the organized medical profession and the practitioner of medicine. I can assure you they are not a group of nine old men who do nothing but obstruct. They do obstruct when many bizarre proposals come in that are obviously the work of some one with an obsession. Certainly then they obstruct, and that is their function.

I hear little stories going around the country urging that we should have more publicity because we are in bad with the public. I don't believe that statement. At the first meeting of the American Medical Association, practically a hundred years ago, somebody made the statement that they ought to do this or that because he was fearful that the medical profession at that time was in bad with the public.

I ask my patients how they feel about the doctors of medicine. I talk to taxicab drivers, bootblacks, barbers, manicurists and other people. I find little unfavorable criticism of the medical profession. Much of this is nothing but propaganda by self-seeking people. I wish again to emphasize that in my opinion the medical profession stands well with the people in this country; those who say we do not do not know what they are talking about.

I also hear much about the Wagner act. It has had a good deal of publicity. We have all worked hard on it. The combating of the Wagner bill is your job. Each doctor, and this is the message I would like to give you so you may take it back to your constituents, should devote two hours a day to considering this thing and spreading the gospel of what this act means.

The American Medical Association, after all, is your organization. The policies are made by you who elect your representatives in the House of Delegates. Your function, as editors of state journals and secretaries, is to go back and present some of these matters in their right light.

Relationship of Procurement and Assignment Service and State Medical Associations

DR. HAROLD S. DIEHL, Minneapolis, Member Directing Board, Procurement and Assignment Service for Physicians, Dentists and Veterinarians, War Manpower Commission: The Directing Board of the Procurement and Assignment Service has authorized me to express to you, the secretaries of county and state medical societies and the editors of medical journals, its sincere appreciation for the invaluable assistance which you have rendered in the conduct of the work of the Procurement and Assignment Service. Ever since the establishment of this service many of you have devoted a major portion of your time and energy to it. In most states without your cooperation it would have been impossible to do the job and it has become increasingly obvious that the best work has been done where medical societies and Procurement and Assignment Service committees have cooperated most closely and effectively.

When the President of the United States, by executive order, created the Procurement and Assignment Service, he gave to the medical profession of this country the opportunity to itself mobilize, organize and distribute its members in the interests of the war effort. The results would seem to justify this confidence in our profession that we could and would do this effectively.

Medical societies are not expected to, in fact cannot, accept responsibility for the policies or acts of the Procurement and Assignment Service. As an agency of the federal government this service must accept responsibility for its actions. On the

other hand the Procurement and Assignment Service was established on the recommendation of the American Medical Association, and its actions and accomplishments will reflect either credit or discredit on the entire profession. That this has been appreciated is evident from the splendid support which medical societies have given to Procurement and Assignment Service committees. To complete the job still confronting us and to merit future opportunities to handle our own affairs will require the cooperation of every medical society and every member of the profession with the Procurement and Assignment Service. The Directing Board appeals to you for this cooperation.

Foremost among the problems with which we are faced is to aid the Army and the Navy in the recruitment of additional medical officers. The unprecedented number of approximately 50,000 physicians are already in service. Yet our armed forces have reached such a size that the ratio of medical officers to the total strength is only about 60 per cent of that which was considered necessary by responsible authorities to provide adequate medical care in time of war.

All of us hear reports of physicians who are not professionally employed or who are making but little use of their special training and skills. In the mobilization of a vast army and navy some of this is inevitable, but as the tempo of the war is increasing not only will the physicians in service be kept thoroughly busy but many more will be needed to provide for our soldiers the medical care to which each and every one of us would insist they are entitled.

The Procurement and Assignment Service has been alert to underutilization of physicians by the armed forces, but I can assure you that the Directing Board now feels that there is a critical and immediate need on the part of both the Army and the Navy for more medical officers. No one anticipates that it will be possible to procure the number which these services feel that they should have, but the Directing Board does believe that 6,000 or possibly 7,000 more physicians could be withdrawn from certain areas of civilian practice without endangering the health of the civilian population.

To secure this number, physicians must come from all areas in which they can be spared, irrespective of state quotas. Every physician who is not essential where he is must be marked "available" by the Procurement and Assignment Service. And, having thus been released, such physicians must be induced to go into service. At this crucial stage in our war effort no community must be permitted to hoard physicians, and no physicians must be permitted to evade their obligations.

Each of you could cite examples of war industries which have attracted thousands or tens of thousands of workers and their families to areas where little or no medical care has been available, or of medical schools with faculties so depleted that they are unable to maintain the quality of medical education which has become standard in this country, or of hospitals with staffs so reduced that the welfare of the patients is prejudiced, or of civilian communities without that minimum of medical care which is essential for safety. With 50,000 physicians withdrawn from the civilian population and an estimated 6 million people who have moved their homes as a result of the war, some shortages of physicians' services are inevitable. It is the responsibility, however, of the Procurement and Assignment Service and the medical profession to keep these unsatisfactory situations to a minimum. Up to now we believe that this has been done. To maintain as satisfactory a record in the future will be more difficult.

The additional physicians to be released for military service must be most carefully selected. War industries and war boom communities are becoming stabilized, but some of these are still without adequate medical care. Medical schools can release few if any more members of their staffs for military service, and some schools must either have additions to their faculties or reduce the size of their student bodies if a satisfactory quality of instruction is to be maintained. Furthermore, the longer the war continues, the more numerous and acute will become the shortages of physicians remaining for civilian medical care. This is inevitable because the number of graduates of medical schools who will be available each year to enter civilian medical practice is far less than the annual loss of civilian practitioners through death and disability.

Policies and procedures to deal with these situations have been developed and agreed on jointly by the Procurement and Assignment Service, the United States Public Health Service and the War Participation Committee of the American Medical Association. In essence, they provide for the cooperative effort of these groups within each and every state to meet these problems. Such combined efforts were important a year ago; they are imperative today.

Basic to all planning for the remaining duration of the war is complete, accurate and current information concerning the qualifications, location and activity of every physician in the United States. This essential inventory of our medical resources can be made only by the cooperative effort of medical societies and the Procurement and Assignment Service.

We need your assistance also in appraising civilian needs for medical service, in formulating plans to meet these needs and in inducing individual physicians to locate in areas where there are shortages of medical care. We have enough physicians in this country to provide essential medical services during the war for both the military forces and the civilian population if we can distribute them properly and utilize their services effectively. To accomplish such distribution and utilization, however, will require our united as well as our individual efforts.

DISCUSSION

DR. MAXWELL LAPHAM, Executive Officer of the Procurement and Assignment Service: As Dr. Diehl has said, the Army and the Navy do need several thousand more physicians. We have attempted to organize another recruitment program during the past couple of weeks whereby the Army, the Navy and the Public Health Service are meeting with the Procurement and Assignment Service in individual states and going over again the lists of physicians who are declared available for military duty. We have tried this out in Boston and in New York with only a limited degree of success. Unfortunately, many of these men have already been disqualified. Some of them have felt they were disqualified; others feel they are not where they are, and a good many of them are not acceptable to the Army and Navy. As a consequence, only a few hundred of the several thousand will probably be commissioned. However, I think it is worth while continuing this program on a national basis. As soon as we can organize it we will again call on the states to have the officials of the Army and Navy and the U. S. Public Health Service sit in their offices, go over lists of all available physicians again and have consultations with these physicians called into the Procurement and Assignment office so that we can clear up finally all of the men who have been declared available and who have not applied for commissions. Certainly the available men under 38 years of age should be reported to Selective Service if they have not applied for commissions. The Selective Service headquarters tells us that there are a few doctors now who are being inducted, at least in some instances, thereby speeding up the commissioning of men who have been reluctant to apply for commissions before. It has been estimated that possibly 7,000 men are in the available list at present. This does not mean that 7,000 men are physically and professionally accepted for military service. We shall have to deduct the men who are physically and otherwise disqualified.

I would like to mention the new intern resident program. This, we feel, should begin as soon as possible, because many hospitals are in great need of house staffs. Practically all the residents and interns in the hospitals at present are commissioned in the Army and Navy if they are physically qualified. The time would have come shortly when there would have been no residents available for hospital service except those who were physically disqualified, if the Army and Navy had not cooperated in deferring a certain percentage of interns to serve as residents. We realize that there was not an equitable distribution of interns in the United States. Unfortunately there are not enough interns in the United States to fill approved internships; but we have attempted to distribute them as equitably as possible. We have not assigned interns of accredited schools to hospitals that have not been approved by the Council on Medical Education and Hospitals. Many hospitals which in the past had had two year internships took on double the number when the

internship was cut to one year, so if an attempt at distribution had not been made there would have been 500 less interns to distribute in the one year that there had been formerly. We also know that there are about 600 fewer graduates of medical schools who will be available for distribution to civilian hospitals than we had expected this year because the Navy has taken 600 interns into its own hospitals, the Public Health Service has taken 80 into the marine hospitals, so that instead of having 5,200 to distribute we have only about 4,500. As a consequence I can scarcely see how many interns will have to take inferior internships. I would expect that of the 8,000 internships which are approved by the Council on Medical Education and Hospitals approximately half ought to be acceptable to any accrediting agency which might criticize this distribution. Unfortunately, some contracts had to be broken. I have heard, however, from many hospitals, some of which criticized the program most bitterly, that they have been able to send their interns with whom they had contracts to satisfactory internships in other hospitals. I think that within the next few weeks, through the efforts of *THE JOURNAL*, we shall be able to place all of the men who had to seek new internships in hospitals which will be satisfactory to the individual.

The 9-9-9 program for the next nine months, I think, will be much more satisfactory, because with the experience we have had this time in distribution we certainly can improve on it for the October period. With the state committees having a much better insight into the need of local hospitals, their recommendations will be followed as far as possible, so that by the time the schedules are sent out for the next nine months period I think there will be much less difficulty in the distribution of interns and residents to the accredited hospitals in the country.

I might say something about the relocation of physicians. There have been about 2,100 relocations up to the present time in areas where there is said to have been a need. This is a remarkable contribution as far as our state and local committees are concerned, because certainly they have been responsible in large part for this allocation of physicians to the critical areas. We have three groups of people about whom we speak often, and whom we expect to take care of all emergency situations; that is, the physically disqualified practicing physician, the man who is discharged from the Army or the Navy, and the physically disqualified intern and resident. The physically disqualified intern and resident will be used largely, I am afraid, in residencies in the hospitals. We expect some of them, however, to be used for relocation in the critical areas. We should not expect that all physicians who are discharged from the Army and Navy would go back to their homes to practice but that many of them would be interested in going elsewhere. The physically disqualified man who has never been in the service is a very difficult person to move from the place where he is practicing and where he is doing a good job. We therefore have a limited number whom we can select to go to various areas in the country where they are needed. Just recently we have persuaded the Veterans Employment Service of the War Manpower Commission to interview for us physicians who are being discharged from the services, getting information as to whether they want to go back to the place where they did practice before they went into the service, whether they would be willing to go somewhere else, and other pertinent information which will be helpful to us and which we shall send out to our state committees to help them in distributing these men wherever they can be persuaded to go.

DR. R. B. ANDERSON, Fort Worth, Texas: Do residents previously rejected for commissions have to reapply for commissions when you ask for them to be deferred? Does that have to show on the form?

DR. LAPHAM: If they have been disqualified by the Army since August 1942 they do not have to reapply for a commission. If any one had been disqualified before that time he was supposed to have applied for a commission again, because the standards had been lowered since that time.

DR. ANDERSON: When making a request for the deferment of a resident, if he has been previously disqualified for a commission within the past year all we have to do is to so state on the form?

DR. LAPHAM: You do not have to ask for the deferment of a man who has been disqualified by the Army because he does not hold a commission.

DR. ANDERSON: At what time before the expiration of an internship should appeal for deferment for a residency be made?

DR. LAPHAM: It should be made as soon as the man is appointed to the residency. In other words, if you want to start next week requesting us to ask for the deferment of a man who is now serving a junior residency and who is a commissioned officer, to serve as a senior resident beginning next October, you may do it. I would prefer that you wait until possibly the first of March or April, until we can reappraise all the hospitals, so that the state chairman will have in their offices the quotas which are established. If, however, there are instances in which a hospital wishes to know definitely whether it can employ a certain person because he is planning to go to some other hospital, then I think you may ask for the deferment of that man right away for the period beginning October 1.

DR. ANDERSON: If an intern, man or woman, refuses to apply for a commission, is there any use asking for deferment of that physician for residency?

DR. LAPHAM: There is no point in asking for his deferment anyway, if he is not a commissioned officer, as long as you stay within the quota established for that hospital. You have only to ask for deferment on those people who are commissioned either in the Army, the Navy or the Public Health Service, but you should insist on every physically qualified noncommissioned intern or resident applying for a commission.

DR. W. S. LEATHERS, Nashville, Tenn.: I should like to ask a question with regard to the assistant resident who has been deferred until July 1. If that man goes July 1 we shall fail to have our quota between July 1 and October 1. What can we do about that?

DR. LAPHAM: Those men who were commissioned recently and who were deferred for a complete year of residency were deferred largely until July 1. We discussed this problem with the Surgeons General of the Army and the Navy and tried to get them to say that they would defer all of those men to October 1, which would make the program balance and would not leave a gap in house staffs from July to October. They were not willing to do that at this time, but I believe that between now and the first of May we shall be able to work out with the Surgeons General of the Army and the Navy some plan by which some of those men will be deferred until October 1. We felt that we had gotten over one big hurdle when we were able to get a certain number of those men deferred for the nine month period.

DR. T. M. DYE, Clarksdale, Miss.: What is the chance of getting a commission for a man who is physically fit and a little over 45 years of age? In my state, Mississippi, in the beginning of the Procurement and Assignment Service the survey showed that there were only 350 available doctors. Out of those 350 doctors we have already commissioned 300. We have a few men who were in the first world war, over 45 years of age, who would like to get a commission.

DR. LAPHAM: The Army and Navy both, of course, will take men up to and beyond age 45, but they have felt from experience that they would prefer to have the men under 38, particularly, but certainly, generally speaking, only men up to 45. They can use them in practically any field, and the older men they feel they cannot. At the present time in the Army and the Navy there are about 2,900 physicians over 45 years of age. Many of them, of course, are members of the regular army or navy medical corps. However, if the man over 45 has special qualifications which will make him unusually useful to the Army and Navy, they will accept him, and they are quite willing to accept the applications of those men.

DR. RANKIN C. BLOUNT, Louisville, Ky.: I hope that Dr. Lapham will recall that chairmen have been called on to clear for review a great many cases of men who have been rejected for physical reasons. Some of us have the impression that for standards have been lowered. However, in my state I have cleared many men for review. I can recall only three who were qualified after examination. Many of the men who have been

cleared for review have been put to a great deal of expense of time and have come in with conditions for which they were rejected formerly, and the examination station was told that there should have been no reason for them to come in. For instance, two had heart disease and hernia, and any number of them had arthritis. The first of this week I had the Army procurement officer come to my office with over forty names. I went over my records carefully with him to show cause for rejection. Among that list were three who had been rejected and who had held reserve commissions, who were over 50 years of age. Among that list were seven who had been released from the Army, and it was suggested that we review them. When I got through with the list the procurement officer agreed with me that there certainly was not more than a possibility of three men passing a physical examination again. I didn't mind the time it took to go over the list; it took practically half a day for him and me to clear all of those records, but I am wondering by what process the Army procurement officers are getting some of these names for review and reexamination, whereas on the very face of the records it would seem that unless standards are considerably lowered there would not be a chance of their passing again.

DR. LAPHAM: I am glad you brought that question up, because the Procurement and Assignment Service felt strongly about recommending to the Surgeon General the lowering of physical standards, particularly because we have heard from our state offices, from medical groups, that there were lots of doctors who had been turned down by the Army, who to all intents and purposes were doing a big job at home. Their physical qualifications did not prevent them from carrying a heavy load. In order to get as many doctors as possible for the Army and Navy, we said we would be glad to clear any physically disqualified men they wished to reconsider. The reason we insisted on clearance a second time was that a great many of them have been put in essential positions and we want to be sure that these particular ones were still available for military service. As far as I know, the Surgeon General's Office has gone over that list and has indicated the names of men who they thought might pass a second physical examination. I am sure in some instances they have been wrong. Somewhere between 20 and 30 per cent of these men, whose names have been sent to us for clearance a second time, are now qualified for commissions. So possibly it has been worth while. I think the Army has sent us the names of some 1,800 or 2,000 physicians. We have cleared at the present time something like 1,200 or 1,400, and we hope we can get a few out of the remaining number.

The War Participation Committee as a Coordinating Agency

DR. WALTER F. DONALDSON, Pittsburgh, Chairman of the War Participation Committee of the American Medical Association: War Participation committees do have a function. If you have enough faith that your committee may render a service, you are going to find opportunities to give advice, and that is what a lot of us love to do. When I write to you as chairman of the Association's Committee on War Participation regarding a similar committee in your state, you reply to me "That work is being done by our Committee on Procurement and Assignment." Now, gentlemen, the Committee on Procurement and Assignment in any state medical association has certainly had enough to do in the last two years not to be looking for extra duties. Many of them served a year preceding that appointment as members of a Committee on Medical Preparedness. Undoubtedly their thinking in these directions is pretty well consolidated, and they are not likely to be enthusiastic when our committee or somebody else writes and asks them to get outside of that field.

Our committee has found opportunities to coordinate. Since the last meeting of the House of Delegates we have been called to Washington twice by the directing board of Procurement and Assignment. They had problems which they thought we could help them solve, and we were pleased to respond. I am sure in some instances we did help with the solution of these problems. We accomplished more in that solution in the states where there is a separate Committee on War Participation than we did in the states where there is no committee with

that specific title. I realize that you as secretaries and editors cannot authorize or create such committees, but I would appeal to you to put the pressure on your board of trustees or your council, or whatever you might call that important group, to authorize the creation as soon as possible of a Committee on War Participation; then, at the next meeting of your state association, have that confirmed by your house of delegates. In a number of states the Committee on War Participation can do a tremendous amount of leg work for Procurement and Assignment. As you have heard their difficulties described here today, I think you should be willing to agree that it would not do that situation harm in many states if some new faces entered into the various communities where there are men who need to be smoked out to apply for a commission. It is not only in the large cities that men who should be commissioned are in hiding. There is many a town and city in the United States with a population anywhere from 10,000 to 25,000 that has two or three doctors who might well be spared.

A Committee on War Participation might very well interest itself in the maintenance of war records of their fellow members absent in the service. There is no finer contribution that a county medical society could make to win the affection of a

young man. Let him learn either while he is in service or when he comes back that his fellow practitioners on the home front have interested themselves in recording his commission, his service and everything else that goes with that sort of a record. I believe—and other members of my committee believe—that the doctors who are in the service under 35 years of age are going to expect change in the local medical situation when they return to private practice. National committees may readily plan opportunities for graduate study to be available to all returning physicians, and doubtless openings for returning practitioners will be carefully assembled on a national scale for the choice of the unsettled physician. But what of the military doctor who has ideas not yet crystallized in his own mind or whose chief immediate worry anent his return is economic? Who can anticipate the needs that may be amenable to constructive aid or solution better than his fellow practitioners remaining on the home front? How better obtain the answers to such questions than by addressing them to your members before they come home. The responsibility of formulating plans to assist state medical society members returned or returning from military service may well be assigned to your war participation committee.

(To be continued)

WOMAN'S AUXILIARY

Colorado

The Woman's Auxiliary to the Colorado State Medical Society recently issued its yearbook, which has been dedicated "to the Doctor." It contains the report of the Philanthropic and Benevolent Fund, which shows on Sept. 1, 1943 a balance of \$5,364.29. The trophy, a silver bowl, goes to Pueblo County for having made the largest per capita contribution to the Emergency Fund. Mrs. Laurence T. Brown of Denver is president.

Georgia

A booklet containing the program for the year's work of the Georgia auxiliary has been compiled by the president, Mrs. Olin S. Cofer of Atlanta. The general theme is "Health for Defense." The auxiliary will stress education on proper nutrition and education about tuberculosis, cancer and venereal disease.

Indiana

The annual convention of the Indiana auxiliary was held in Indianapolis recently, with an attendance of 300. Mrs. James W. Baxter Jr. is the new president. Mrs. Rollo K. Packard, one of the speakers, urged the members to fight the Wagner-Murray-Dingell bill, saying "Since there are more women than men to vote in the next election, what greater opportunity could we have?"

Allen County has two projects for the year—the sponsorship of occupational therapy for the patients of the Irene Byron Sanitarium and the collection of costume jewelry for service men stationed in the Pacific Islands.

Members of the Floyd County auxiliary assisted the Floyd County Medical Society and the Third District Health Department in the annual immunization program.

Michigan

The seventeenth annual meeting of the Woman's Auxiliary to the Michigan State Medical Society was held in Detroit recently. There were 63 delegates and 43 guests registered. Mrs. J. J. Walch is president for 1943-1944. Mrs. Eben J. Carey, national president, spoke of the growth of the auxiliary and explained the Nurses Cadet Corps project.

Ohio

The Belmont auxiliary and medical society contributed sufficient funds to care for a Chinese orphan for a year.

Lucas County auxiliary had a luncheon meeting in October at the Toledo Women's Club, and a panel discussion on "Juvenile Delinquency in Lucas County" was held.

The new project of the Ross County auxiliary, which has made dresser covers and tray cloths for the hospital and done

much Red Cross sewing, is the making of surgical bandages from material reclaimed from recapped tires. Members wash material at home and return it cleaned and pressed to the Red Cross rooms.

Cuyahoga's special project is knitting for the Red Cross. Since the beginning of the project 768 articles have been completed.

Oklahoma

A recent issue of the *Journal of the Oklahoma State Medical Association* contains an article by Mrs. F. Maxey Cooper, president of the Oklahoma auxiliary, in which she writes "The year ahead bring us a threefold challenge: (1) We must meet immediate war needs, (2) we must carry on as normally as the time will permit, (3) we must plan for peace and a better world of the future."

Pennsylvania

The Pennsylvania auxiliary will assist in obtaining complete war records of the physicians in service. At the fifteenth annual meeting of the second councilor district of Pennsylvania, held at Reading recently, the auxiliary membership in the district was 541, and \$1,175 was given to the Medical Benevolence Fund.

Berks County auxiliary, at a meeting held recently in Reading, voted to pay for the duration all dues, state and benevolence, of all wives in the auxiliary whose husbands are in the service.

Cambria, Erie, Franklin and Lycomings auxiliaries report good meetings. The latter auxiliary purchased three \$100 war bonds during the third war loan drive.

The Woman's Auxiliary to the Beaver County Medical Society met at the Penn Beaver Hotel, Rochester, Pa., November 23. Thirty-two members were present. Mrs. A. W. Cully, president, conducted a short business meeting. Mrs. J. L. Whitehill gave a report on the Wagner-Murray-Dingell bill and the activities of the recent state convention at Philadelphia. Mrs. J. A. Stevens, Aliquippa, was appointed chairman of the War Participation Committee. The annual benevolences of the auxiliary were (1) \$50 to the Passavant Hospital, (2) \$50 to the Beaver County Tuberculosis Sanitarium, (3) a \$10 T. B. bond and (4) \$5 to the Salvation Army. The speaker was Dr. J. A. Mitchell, who spoke on industrial medicine.

Mrs. Walter Orthner, president of the Pennsylvania auxiliary, said in her address that, "While we, the United Nations, are fighting this great conflict for the four freedoms, we on the home front must continue to fight for the fifth freedom, namely freedom of individual enterprise. If we allow ourselves to become regimented or bureaucratically dominated, we only follow in the footsteps of those dictator nations against which we are battling."

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH)

CALIFORNIA

Physicians Needed.—The department of civil service and personnel of San Diego County announces that the positions of superintendent of the San Diego County General Hospital and assistant director of county public health are available. The former position will pay between \$490 and \$586 a month and the latter \$349 to \$364. Additional information can be obtained from the department of civil service and personnel, Room 212, Civic Center Building, San Diego 1.—The Los Angeles County Civil Service Commission announces openings for positions as resident physician (urology) in the Los Angeles County Hospital and other county institutions, the applications to be filed on or before January 20. Further details can be obtained from the office of the commission, 102 Hall of Records, Los Angeles 12.

CONNECTICUT

Liberty Ship Named for Harvey Cushing.—A liberty ship named in honor of the late Dr. Harvey Cushing, New Haven (SS 1896), was recently launched at the St. John's Shipyard in Jacksonville, Fla. A U. S. Army Hospital at Framingham, Mass., is also to be named in honor of Dr. Cushing and will be known as the Cushing General Hospital. During World War I Dr. Cushing organized base hospital number 5, the Harvard Medical School and Peter Bent Brigham Hospital unit. The buildings of the new hospital are completed and the hospital is staffed, according to the *News* of the Massachusetts General Hospital. The late Dr. Cushing held the rank of colonel and received the Distinguished Service Medal for his service during World War I.

Medical Students Awarded Prizes.—At the graduation exercises of Yale University School of Medicine, New Haven, December 18, the Ferris Prize in anatomy, given for excellent work in dissection, was divided among three students: Thomas A. Doe, Linden, N. J., James A. Kleeman, Springfield, Ohio, and William J. Wedemeyer Jr., Upper Montclair, N. J. The Campbell gold medal, awarded to the graduating student who secures the highest rank in the examinations of the course, was given to Dr. Donald W. Seldin, Brooklyn, honorable mention went to Dr. William K. Welch, Lebanon, Pa. The Keese Prize, awarded to the student who presents the best thesis was given to Dr. Charles W. Watson, Tulsa, Okla., with honorable mention to Dr. John J. Milford, Huntsville, Ala. Dr. James L. Bradley, Lyons, N. Y., received the Parker Prize given to the graduating student who has shown during his course the best qualifications for the successful practitioner. The Ramsey Memorial Scholarship, awarded to the student of unquestioned ability and character after completing his first year in clinical medicine, was given to Robert E. Cooke, Windsor, Conn., and the Mendel Prize in physiologic chemistry went to Edward F. Edinger Jr., Bedford, Ind. Forty-nine students received the degree of doctor of medicine, of whom Dr. Bradley, Dr. Ira A. Rashkoff, New York, Dr. Ellen F. Regan, Framingham, Mass., Dr. Seldin, Dr. Welch and Dr. James T. Wolstenholme, Clifton, N. J., were graduated cum laude.

FLORIDA

State Medical Meeting to Be in St. Petersburg.—The seventy-first annual meeting of the Florida Medical Association will be held in St. Petersburg, April 13-14.

Physicians' Committee Appointed for Fee Schedule.—A special committee was recently created to represent the Florida Medical Association when called on by the Florida Industrial Commission (workmen's compensation division) in matters relating to a fee schedule. Members are Drs. Ferdinand A. Vogt, Miami, chairman, Alfred M. Bidwell, Tampa, Frank L. Fort, Jacksonville, Lloyd J. Netto, West Palm Beach, Eugene G. Peek, Ocala, and Wilfred McL. Shaw, Jacksonville.

Personal.—Dr. James Maxey Dell was recently selected mayor commissioner of Gainesville. Dr. Dell, who is beginning his ninth year as a member of the commission, served as mayor commissioner in 1938-1939.—Dr. George N. MacDonell,

former health officer of Miami, has been appointed chief of the medical service division of the Dade County Defense Council. Dr. MacDonell succeeds Dr. Gerard Raap, Miami, who recently resigned because of ill health.—Dr. Charles L. Clay, Miami, has resigned as medical superintendent of the James M. Jackson Memorial Hospital, effective November 1. The state medical journal reported that the hospital would be reorganized into two divisions with a medical director and a business administrator.

ILLINOIS

Investigate Sale of Vitamins.—Charges that the state of Illinois had paid thousands of dollars for inferior and useless vitamin pills sold to twelve mental hospitals were to be investigated by federal authorities, newspapers reported, December 16. It was stated that the food and drug administration had requested the state department of public welfare to prepare a report on alleged sales involving hospitals at Alton, Anna, Dixon, Elgin, Moline, Menard, Kankakee, Manteno, Jacksonville, Peoria, Lincoln and Chicago. Payment on a \$60,000 contract was ordered stopped until contents of the latest shipment were tested, it was stated. Public welfare officials were reported to have complained that the pills were below specifications and that previous shipments had been received in defective and unusable conditions. The newspaper reports stated that the vitamin sales, exclusive of the \$60,000 order, totaled about \$75,000. The reports stated that one recent shipment was rejected because it contained "just bottles full of oil" resulting from bad packing, and that another shipment contained only 25 per cent of the vitamin quantity desired.

Chicago

Annual Election of Institute of Medicine.—Dr. Ludvig Hektoen was again chosen honorary chairman of the board of governors of the Institute of Medicine of Chicago at a recent meeting. Dr. William F. Petersen was again named chairman and Dr. Andrew C. Ivy was chosen president. Other officers are Drs. Harry S. Gradle, vice president, George H. Coleman, secretary and Grant H. Laing, treasurer. The newly elected members of the board of governors for terms of given years each are Drs. Bowman C. Crowell, Herman L. Kretschmer and Eric Oldberg.

Meeting of Psychotherapy Council.—The second annual meeting of the Brief Psychotherapy Council will be held at the Ambassador Hotel, January 14-16, under the auspices of the Chicago Institute for Psychoanalysis. The first day will be given over to a discussion of "War Psychiatry" and the second to "Therapeutic Aspects of Psychosomatic Medicine." The third day will be divided between "Psychotherapy for Children" and "Group Psychotherapy." Included among the speakers will be:

- Lieut. Col. John M. Murray, M. C., A. U. S., Some Special Aspects of Psychotherapy in the Army Air Forces
- Dr. Alvan L. Barach, New York, Impairment in Emotional Control Produced Both by Lowering and by Raising the Oxygen Pressure in the Atmosphere, with Observations on Normal Young Men Exposed to an Altitude of 15,000 Feet
- Lieut. Col. Roy R. Grinker, M. C., A. U. S., Use of Brief Psychotherapy in War Neuroses
- Molly R. Harrower-Erickson, Ph.D., Montreal, The Use of the Multiple Choice Test in the Military Services
- Samuel J. Beck, Ph.D., Rorschach's Test in Men Discharged from the Military Services
- Frederic L. Wells, Ph.D., Boston, Notes on the Recognition of the Psychologically Marginal Recruit
- Dr. Bela Mittelman, New York, The Cornell Selectee Index: A Method for Quick Testing of Selectees for the Armed Forces
- Major Milton L. Miller, M. C., A. U. S., Brief Psychotherapy in a Preflight Training Center of the Air Corps
- Capt. Carel von der Heide, M. C., A. U. S., Psychiatric Observations in Two Station Hospitals
- Dr. Edward Weiss, Gastrointestinal Disturbances
- Dr. George E. Daniels, New York, Diabetes
- Dr. Thomas M. French, Asthma
- Dr. Helen Flanders Dunbar, New York, Rheumatic Disease, with Special Reference to Psychosomatic Diagnosis and Treatment
- Dr. Franz G. Alexander, Psychologic Approach to Hypoglycemic Fatigue
- Dr. Irving Edward Liss, New York, Sadosmochism in a Case of Thrombocytopenic Purpura Hemorrhagica
- Dr. Editha Sterba, Grosse Pointe Park, Mich., Brief Psychotherapy with Orthopedic Cases
- Dr. Marian C. Putnam, Boston, Psychotherapy in a Guidance Center for Infants and Preschool Children
- Dr. Emmy Sylvestre, Chicago, Emergency Treatment of Severe Feeble-minded Disturbances
- Fritz Redl, Ph.D., Detroit, Problems in Clinical Group Work with Children
- Kurt Lewin, Ph.D., Iowa City, Experiments on Rapid Changes in Industry
- Dr. Jacob L. Moreno, New York, A Case of Paranoia Treated Through Psychodrama

LOUISIANA

Dr. Pinto Resigns as Director of Industrial Hygiene.—Dr. Sherman S. Pinto, New Orleans, supervisor of the section of industrial hygiene of the Louisiana State Board of Health, has resigned to accept a commission in the medical corps of the U. S. Army. W. H. Reinhart, engineer in the section, is acting director.

MISSISSIPPI

License Revoked.—The state board of health, acting as a legal court of inquiry, on October 21 revoked the license of Dr. Benjamin F. Johnson II, Jackson, after he was found guilty of "procuring an abortion or abortions that were not necessary to preserve the life of pregnant women."

Personal.—Dr. Harvey F. Garrison, Jackson, has been appointed a member of the advisory committee to the U. S. Children's Bureau, Department of Labor, Washington, D. C. —Dr. Cyrus M. Shipp, Bay St. Louis, director of the Hancock County Health Department, was recently chosen president-elect of the Mississippi Public Health Association and Dr. John B. Grant, McComb, was installed as president.

MISSOURI

State Cannot Restore License to Muench Without Examination.—Attorney General Roy McKittrick informed the state board of health in an opinion November 30 that it does not have authority to consider the application of Dr. Ludwig O. Muench, St. Louis, for restoration of his medical license, but that it might pass on an application for an examination and issuance of a new license, according to the *St. Louis Globe-Democrat*. Dr. Muench was released on June 6 from the federal prison at Terre Haute, Ind., having served six years on a conviction of using the mails to defraud, newspapers reported (*THE JOURNAL*, July 31, 1943, p. 959). He was found guilty in 1935 of unlawfully and fraudulently making out, signing and certifying a fraudulent birth certificate. In 1937 his license to practice medicine was revoked by the state board of health for unprofessional and dishonorable conduct. An application for restoration of the license was filed in September, the *Globe-Democrat* reported. It was stated that the attorney general's opinion held that the action of the state board, taken March 10, 1937, revoked Dr. Muench's license permanently and pointed out that there is nothing to prevent the physician from filing application for a new license and that the state board would have authority to consider such an application, subject to present laws and rules and regulations.

NEBRASKA

Newspaper Finances Children's Hospital.—The *World-Herald* has given \$100,000 toward the construction of a children's hospital in Omaha to be called the Children's Memorial Hospital and to be erected on ground leased from the University of Nebraska College of Medicine. In addition, stockholders of the *World-Herald* have contributed \$15,000 toward the project. The hospital will be entirely independent of the university and not a state institution. A 50 bed unit, expected to cost at least \$200,000, will be constructed first. The remainder of this cost above the contribution of \$115,000 will be raised by public subscription. According to the *World-Herald* complete development of the plan calls for a 150 bed hospital, and additions to reach this size, it is hoped, will be financed by later donations and bequests. The hospital will be operated by a nonprofit corporation of which A. A. Lowman, W. Dale Clark, Ben H. Cowdery, David Goldman, C. Louis Meyer and Linn P. Campbell, all of Omaha, were the incorporators. Mr. Lowman is president, Mr. Campbell, vice president, Mr. Cowdery secretary and Alvin E. Johnson, Omaha, treasurer. The \$115,000 donation carried no stipulation but recommended to the trustees that about 40 per cent of the beds be maintained for children whose parents are unable to pay and that these beds be free to child residents of Nebraska and western Iowa and "that the hospital be kept under private management of a board of trustees solely for the benefit of our community, and that it be entirely undenominational and open to the public generally and that the medical staff be picked impartially from all the doctors in the city." It was stated that the American Academy of Pediatrics would be enlisted in the formation of the staff. The hospital will be located on a site somewhat larger than a city block between 44th and 45th

streets and Dewey Avenue and Jackson Street. The *World-Herald* in announcing the gift pointed out that there is not a children's hospital in Nebraska. An attempt will be made to obtain priorities so that plans for the new project may go forward as soon as possible.

NEW YORK

Chief Resident Wins Clough Prize.—Dr. Andrew Kerr Jr., chief resident physician at the Rochester General Hospital, Rochester, on December 17 was named the first recipient of the Harry D. Clough Memorial Prize. The award, which is limited to house officers, is conferred on the basis of excellence of conference case presentations and general support of the weekly clinical conference at the hospital. Its establishment was announced October 22, and the award consists of the \$25 cash prize and the inscription of the recipient's name on a special plaque in the conference room. The prize is a memorial to Dr. Clough, assistant medical director of the hospital, who died Oct. 1, 1942 and who worked for the development and improvement of the hospital conferences (*THE JOURNAL*, Nov. 27, 1943, p. 850).

New York City

Fourth Harvey Lecture.—Karl Paul Link, Ph.D., professor of biochemistry, University of Wisconsin, Madison, Wis., will deliver the fourth Harvey Society Lecture of the current series at the New York Academy of Medicine on January 20. His subject will be "The Anticoagulant from Spoiled Sweet Clover Hay."

Lectures to the Laity.—A group of lectures to the public will open January 14 at the Brooklyn Academy of Music with a talk by Col. Charles M. Walson, M. C., U. S. Army, on "Progress of Medicine in War." Others in the series will include Dr. Benjamin W. Carey, Pearl River, N. Y., "Germs and Germ Fighters," January 21; William M. Malisoff, Ph.D., "The Chemist Looks at Medicine," January 28, and Dr. Louis H. Bauer, Hempstead, L. I., "Medicine Takes to the Air," February 4. The lectures will be sponsored by the Brooklyn Institute of Arts and Sciences, the Medical Society of the County of Kings and the Academy of Medicine of Brooklyn.

Medical and Health Organizations Cooperate in Health Broadcasts.—Public health and medical societies in New York City cooperate with the city's own station WNYC in the program of health talks designed to safeguard and preserve the people's health. According to a release, more than 60 per cent of all health talks heard over New York stations are broadcast over WNYC. On Mondays and Fridays the speaker for the "New York City Health Time" is provided by the New York Academy of Medicine in cooperation with the New York Tuberculosis and Health Association. The Oral Hygiene Committee of Greater New York offers advice on dental matters by prominent members of the dental profession on Tuesdays. Dr. Jerome S. Peterson of the New York City Department of Health gives the Wednesday talks, on community health problems. Thursday morning's speaker is from the Medical Society of the County of New York, and the alternate Saturday discussions are sponsored by the Bronx County Medical Society in cooperation with the Bronx County Tuberculosis and Health Association and the Medical Society of the County of Kings.

Right of Physicians to Prescribe Heavy Cream May Be Withdrawn.—On December 22 the Milk Industry Advisory Committee recommended that the War Food Administration consider withdrawing the right of physicians to prescribe heavy cream for their patients, at present the sole exemption to the nationwide ban on the sale of whipping cream, the *New York Times* reports. The recommendation carried the suggestion that the privilege had been abused and listed a number of specific instances of "alleged abuses" of the right to prescribe heavy cream. The *Times* reported that "one involved the prescription by a physician of heavy whipping cream for seventeen persons in his own family." Many other cases were noted in which the prescribing physician directed his patient to dilute the heavy cream with milk. The *Times* states that all the medical societies in the New York area were informed of the purpose of the meeting at which the action took place and invited to participate in the discussion. None were represented. Public health agencies in the district did attend and advised the committee that the exemption in favor of prescription sales should be reviewed. It was stated that the prescrip-

tion sales created special sanitary problems for handlers, since the mechanized volume production methods used in packaging 19 per cent (light) cream could not be employed and that the system creates a large body of preferred consumers. Quoting a report, it was stated, "Inasmuch as the committee has reviewed opinions that would indicate that heavy cream, in ordinary prescriptive use, has little or no therapeutic or dietetic value superior to cream of lesser butterfat content, the committee is of the opinion that the exemption should be reviewed and probably withdrawn. Among the practices that indicate the wisdom of a review are the common instructions to patients to dilute the heavy cream after buying it and the frequent failure of physicians to prescribe a cream of specific butterfat content. These practices along with specific opinions that the prescription privilege has been outrightly abused are cited in a stenographic record of the committee's last meeting."

PENNSYLVANIA

License Suspended.—The license of Dr. Walter J. Rogan, Dushore, and formerly of Bridgeport, has been suspended because of his violation of that section of the medical practice act which pertains to "habitual intemperance in the use of ardent spirits or stimulants, narcotics, or any other substance . . . which impairs intellect and judgment to such an extent as to incapacitate for the performance of professional duties."

Philadelphia

University News.—A urologic room has been added to the surgical suite of the Hospital of the Woman's Medical College of Pennsylvania through the generosity of Mr. William Goldman. It is outfitted with modern surgical and x-ray equipment for both diagnostic and therapeutic procedures and for teaching and is under the supervision of the department of urology. The department of medicine is conducting a weekly series of postgraduate lectures. First year students are attending a special course of lectures in medical statistics given by Mr. G. St. J. Perrott, chief, division of public health methods, and Antonio Ciocci, S.D., U. S. Public Health Service. Richard H. Shryrock, Ph.D., professor of the history of medicine, University of Pennsylvania School of Medicine, who has been made special lecturer in medical history at the Woman's Medical College, is giving a series of weekly lectures on interpretation of medical history.

Goddard Memorial Lectures on Legal Medicine.—The Philadelphia County Medical Society has named its annual series of lectures on legal medicine the "Dr. Herbert M. Goddard Memorial Lectures on Legal Medicine" in honor of Dr. Goddard, who at the time of his death on Nov. 23, 1943 was assistant director of public health of Philadelphia and county coroner. The second series of lectures, which were inaugurated last year, opened on January 7 with a talk by Chief Justice George W. Maxey on "Legal Aspects of Medical Practice." Subsequent lectures will include:

- Judge Charles Kenworthy, Unprofessional Conduct. Malpractice, January 14.
- John D. Maurer, district attorney of Philadelphia County, and John A. Boyle, first assistant district attorney, Joint Functions of Prosecutor and Coroner, January 21.
- John F. Sears of Federal Bureau of Investigation, Scientific Crime Detection, January 28.
- Dr. Thomas A. Gonzales, medical examiner of New York City, The Medicolegal Autopsy, February 4.
- Dr. Alan R. Moritz, professor of legal medicine, Harvard Medical School, Boston, Special Evidentiary Objectives of Medicolegal Post-mortem Investigations, February 11.
- Dr. John H. Foulger, director of Haskell Laboratory of Industrial Toxicology, Wilmington, Del., Occupational Hazards and Diseases, February 18.
- Irvin Bendiner Esq., Medical Insurance, February 25.
- Dr. Edward A. Strecker, professor of psychiatry, University of Pennsylvania School of Medicine, Psychiatry and Law, March 4.
- J. W. Holloway Jr., director of the Bureau of Legal Medicine and Legislation, American Medical Association, Chicago, Legal Medicine and the Professions, March 11.

TEXAS

Physicians' Art Work.—Through the courtesy of Mead Johnson & Company, Evansville, Ind., an exhibition of physicians' art work was held in the Rosenberg Library, Galveston, recently. The collection was the work of members of the American Physicians Art Association and included a few pieces from Texas physicians.

Hospital News.—The new Orange City-County Hospital, erected with federal funds at a cost of about \$275,000, was recently opened. The one story building has a capacity of 76 beds. Members of the Orange County Medical Society and

the Sabine District Medical Society constitute the charter members of the staff. Dr. Thomas E. Kelly, Mount Pleasant, is chief of staff and Dr. Stanley M. Richmond, Marshall, secretary.

UTAH

Personal.—Dr. Donald J. Bourg, Corvallis, Oregon, has been lent to the state of Utah to serve as director of the first councilor district with headquarters at Ogden, succeeding Dr. William P. Scarlett. The district comprises the counties of Weber, Box Elder, Cache, Rich, Morgan and Summit.—Dr. Paul K. Edmunds, Van Nuys, Calif., has been appointed health officer of district number four of the state department of health with headquarters in Provo.

VERMONT

Changes in the Faculty.—Ferdinand J. M. Sichel, Ph.D., has been promoted to associate professor of physiology at the University of Vermont College of Medicine, Burlington. James E. P. Toman, Ph.D., instructor in physiology, University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, has been named instructor in pharmacology and physiology at Vermont, and Miss Nancy Hart has been named research assistant in the same department.

GENERAL

Ashford Award Goes to Norman Topping.—The Bailey K. Ashford Award was presented to Norman H. Topping, P. A. Surg., U. S. Public Health Service, National Institute of Health, Bethesda, Md., for outstanding work in the field of tropical medicine. The presentation was made during the annual meeting of the American Society of Tropical Medicine in Cincinnati in November. In 1941 Dr. Topping went to La Paz, Bolivia, to study the effects of a typhus vaccine developed at the Rocky Mountain laboratory of the U. S. Public Health Service, Hamilton, Mont. He is a member of the United States of America Typhus Commission.

Award for Research in Human Fertility.—The Planned Parenthood Federation of America announces an award of \$500 to be given in 1944 to the scientist who has made the most significant contribution to research in human fertility, either in the control of conception or in the correction of sterility. Any scientist anywhere in the world will be eligible for the award. In addition, a number of plaques will be granted to others who have done important work in this field, to signalize their achievements. Judging the merits of each submitted work will be members of the medical committee of the federation, including Drs. Richard N. Pierson, New York, Robert L. Dickinson, New York, Nicholson J. Eastman, Baltimore, Abraham Stone, New York, S. Bernard Wortis, New York, George D. Cannon, New York, Sophia J. Kleegman, New York, Harvey B. Matthews, Brooklyn, and H. McLeod Riggins, New York. The first award, a gift of Mrs. Albert D. Lasker, will be known as the Mary Woodward Lasker Prize. The closing date for the submission of entries for the awards will be June 1, 1944. According to Dr. John H. J. Upham, Columbus, Ohio, president of the Planned Parenthood Federation of America, it is hoped that the competition for the prize will serve to stimulate increased research in medical aspects of human fertility.

Pediatric Board Approves Nine Month Graduate Training.—The American Board of Pediatrics has ruled that three nine month periods of graduate training shall constitute acceptable training instead of the previous requirement of three full years of training. Two of the nine month periods must be spent in a pediatric center or, for a part of the period not to exceed six months, in a recognized hospital for the care of contagious disease. This ruling may be applied only in those instances in which the shorter periods of training were the direct result of the present wartime hospital programs for interns and residents. In issuing the ruling the board is forced to point out that the pressure of emergency conditions can in no way be allowed to lower the standards of its examination. It is contemplated that many candidates will find it necessary to seek additional postgraduate training after the war in order to be prepared properly for the examination. Officers of the board, chosen at its annual meeting November 19, are Drs. Edward B. Shaw, San Francisco, president, Donovan J. McCune, New York, vice president and Charles A. Aldrich, Rochester, Minn., secretary-treasurer. Dr. Alexander A. Weech, Cincinnati, was appointed to fill the unexpired term as a member of the board of Dr. Charles F. McKhann, Detroit, who resigned.

Section Meetings on the Ear, Nose and Throat.—The middle section of the American Laryngological, Rhinological and Otological Society will be held at the Hotel Cleveland, Cleveland, January 12. Speakers will include:

- Dr. Robert E. Howard, Cincinnati, A Statistical Study of the Relationship Between Tonsillectomy and Poliomylitis.
- Dr. John R. Lindsay, Chicago, The Cricopharyngeus Muscle in the Production of the Esophageal Voice (Roentgenologic Demonstration).
- Drs. Norman L. Hoerr and Fred W. Dixon, Cleveland, The Lymphatic Drainage of the Nasal Accessory Sinuses.
- Dr. Albert C. Furstenburg, Ann Arbor, Mich., Restoration of the Facial Nerve.
- Dr. Theodore E. Walsh, St. Louis, The Treatment of Laryngotracheobronchitis (with movie).
- Dr. Hans Brunner, Chicago, The Present Status of Diagnosis and Management of Ménière's Disease.
- Dr. Samuel Iglauer, Cincinnati, Two Cases of Osteomyelitis Treated with Penicillin.
- Dr. Thomas E. Carmody, Denver, Facial Injuries Related to the Nasal Sinuses and Oral Cavity.

The eastern section meeting will be held at the Waldorf-Astoria, New York, January 14, at which the following program will be presented:

- Dr. Gabriel Tucker, Philadelphia, Laryngofissure for the Treatment of Intrinsic Cancer of the Larynx: Indications, Technique and End Results.
- Dr. Paul B. MacCreedy, New Haven, Conn., Our Changing Conception of Acute Laryngotracheobronchitis.
- Dr. Frederick T. Hill, Waterville, Maine, The Management of Atelectatic Lung.
- Dr. De Forest C. Jarvis, Barre, Vt., The Part Nutrition Plays in the Production of Clinical Conditions in Otolaryngology.
- Lieut. Comdr. Frank L. Horsfall Jr. (MC), U. S. Naval Reserve, Virus Infection of the Respiratory Tract.
- Dr. Leroy A. Schall, Boston, Laryngocoele Complicated by Cancer: Case Report.
- Dr. Edmund Prince Fowler, New York, Head Noises in Normal and Disordered Ears, Significance, Measurement, Differentiation and Treatment.

At the western section meeting in Elks Temple, Los Angeles, January 22-23, the speakers will include:

- Dr. Gordon B. New, Rochester, Minn., Advances in the Care of Harlequin and Cleft Palate Deformities (with movies).
- Dr. Lorenz W. Ruddy, Sacramento, Calif., An Operation for the Correction of Postnasal Colossal Nasal Atresia in Children.
- Dr. Walter F. Mosher, Ventura, Calif., Adamantinoma of the Maxillary Sinus.
- Dr. Henry J. Profant, Santa Barbara, Calif., Temporal Arteritis.
- Dr. Isidore Friesner, New York, Otolologic Problems.
- Dr. Russell M. Decker, Pasadena, Calif., Facial Nerve Paralysis Associated with Acute Otitis Media.
- r. Benton N. Colver, Los Angeles, Sphenoid Sinus Headaches.
- r. Ben R. Dysart, Pasadena, Modern Viewpoint on Meckel's Ganglion Neuralgia.

The southern section meeting convenes in Atlanta, Ga., January 8, to hear the following program:

- Dr. James W. Jervy Jr., Greenville, S. C., Interesting Case Reports.
- Dr. Watt W. Eagle, Durham, N. C., Otolaryngologic Aspects of Bromine and Acetanilid Therapy.
- Dr. Robin Harris, Jackson, Miss., The Evaluation of Coagulation Time.
- Dr. Gilbert E. Fisher, Birmingham, Ala., The Use of Radium in Conduction Deafness.
- Dr. James Calhoun McDougall, Atlanta, Use of Sulfathiazole Powder with Radical Mastoid Operations.
- Col. Robert M. Colbert, M. O. C., Some E N T Cases in the Service.
- Dr. Alton V. Hallum, Atlanta, Dacryocystorhinostomy, Dupuy-Dutemps Technique.
- Dr. William D. Stinson, Memphis, Tenn., Further Considerations on the Use of Thiamine Chloride for the Relief of Cardiospasm.

Dr. H. Marshall Taylor, Jacksonville, Fla., president of the national group, will attend all the sessions.

LATIN AMERICA

Health Activities in Latin America.—On November 18 the state department authorized the Institute of Inter-American Affairs to finance a project entitled "Biostatistical and Epidemiological Information in the Other American Republics," to be undertaken by the Pan American Sanitary Bureau. Representatives named from each of the twenty American republics will submit a monthly report to the Pan American Sanitary Bureau of new cases and deaths for infectious diseases, including cholera, yellow fever, bubonic plague, typhus, smallpox, poliomyelitis, malaria, cerebrospinal meningitis, tuberculosis (all forms), typhoid, syphilis, leprosy and yaws. Reports will also be made on other public health data such as hospital facilities and the number of physicians in specified localities. It is contemplated that the representatives will make telegraphic reports to the bureau of all epidemics, outbreaks of diseases and other matters demanding urgent attention. On the basis of the reports received by the bureau, a monthly statistical news sheet will be prepared in English and Spanish and distributed throughout the hemisphere to institutions, governmental agencies and individuals interested in biostatistical and epidemiologic information. In addition, it is expected that the information thus obtained will also be compiled, analyzed, published and distributed to interested parties. The joint pro-

ject also provides for the translation and publishing of a Spanish edition of the Manual for Coding Causes of Illness. It is planned that 1,000 copies of this manual will be translated and published in the United States and distributed to various persons engaged in public health activities in the American republics, including the twenty representatives appointed by the Pan American Sanitary Bureau in connection with this project. The entire project will be directed and carried out by the bureau with the assistance of the Pan American Committee on Vital Statistics and Epidemiological Information, which is composed of representatives of the Pan American Sanitary Bureau, the United States Public Health Service, the Institute of Inter-American Affairs and the United States Budget Bureau. The committee will act in an advisory and consultative capacity.

Typhus.—In Guatemala a rigid typhus control program has been inaugurated, a feature of which has been the distribution of morbidity cards to physicians and mayors of Guatemala. By means of the cards 126 cases of the disease were reported during August and 108 during September. Public isolation buildings for the care of patients with infectious or communicable disease were constructed in San Cristoban Verapaz and San Juan Chamelco because of outbreaks of typhus there. During July and August 40 deaths from typhus occurred among a group of 1,000 textile factory workers and their families totaling between 5,000 and 6,000 persons.

Personal.—Dr. John W. Seddon, formerly medical officer with the field party in Brazil, returned to the United States on November 14 for reassignment by the War Department. Dr. Eugene H. Payne was transferred from his position as medical officer with the field party in Brazil to the Mica Mines Medical Assistance Program in the Rio Doce Valley, with headquarters in Vitoria. Dr. Gumersindo Sayago recently resigned as head of the Instituto de Fisiologia de Cordoba and professor of physiology of the Faculty of Medicine of Cordoba.

New Construction.—A new 32 bed hospital has been erected in Pucallpa, terminus of a motor highway across the Andes Mountains into Peru's upper Amazon country. The new building serves employees who are engaged in the development of the area for production of rubber, quinine and other economic resources. The hospital is one of a number of hospitals, health centers and dispensaries being established in the territory with the aid of the United States. The cooperative program is providing modern health services in the region for the first time in connection with colonization and development plans. Present plans call for the erection of five hospitals and fifteen dispensaries at convenient localities. A hospital is nearing completion at Iquitos to accommodate 80 patients.

Course in Tuberculosis.—A postgraduate course on epidemiology of tuberculosis will be given March 13-25 in the Instituto de Tisiología of the Faculty of Medicine of Montevideo. Included among the topics will be tuberculous pleurisy, history and clinical forms of tuberculosis, tuberculosis in Uruguay, significance of tuberculosis in diseases without recognizable microscopic tuberculous lesions, epidemiologic significance of organized antituberculosis crusades, antepartum and postpartum antituberculosis care and BCG vaccination, technique and results of bronchography, modern conception of pulmonary isthmus and question of clinical significance of pretuberculosis. Speakers will include Drs. Alberto L. Matteo, Alfonso Crisci, Juan B. Morelli, Aristeo Piaggio, Pablo Purriel, Abelardo Sáenz, Julio C. García Otero, Fernando D. Gómez, Cleopatra Epifanio, Pedro A. Barcia, Alejandro Artagaveytia, Armando Sarno, Abelardo Rodríguez, Ramón E. Marín Pittaluga, Alfredo Nario, Elbio Nattino, Juan J. Crottogini and Gumersindo Sayago. Drs. Víctor Armand Ugón, Américo Fossati and Juan Soto Blanco will be in charge of the surgical sessions. The address of the headquarters for registration is Secretaría del Instituto de Tisiología, Avda. Larranaga 1380.

FOREIGN

Voluntary Mobilization Urged for Influenza Epidemic.—The Ministry of Health has called on all district councils throughout Britain for a total mobilization of health visitors, school nurses, first aid post and rest center staff members and other agencies to combat the epidemic of influenza.

Society News.—Dr. Andrew Fergus Hewat was elected president of the Royal College of Physicians of Edinburgh at the annual meeting Dec. 2, 1943, and Drs. Charles McNeil, Lewis H. F. Thatcher, Alexander Ninian Bruce, David M. Lyon, William A. Alexander and David K. Henderson were elected to form the council for the ensuing year; Dr. Lyon is vice president.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Nov. 27, 1943.

Penicillin

Penicillin excites such interest that a recent discussion of it at the Royal Society of Medicine produced a crowded meeting. Prof. Alexander Fleming reported that penicillin was the name he gave fourteen years ago to a substance which he obtained from the mold *Penicillium notatum* and which had an inhibitory effect on a variety of organisms. But the early filtrates were weak, and concentration was not possible before the brilliant work of Professor Florey and his colleagues in 1940.

Prof. H. W. Florey told the society that pure penicillin inhibited sensitive organisms in dilutions of 1 in 50 to 100 million and produced morphologic effects on the streptococcus in dilutions of 1 in 250 million. The sensitive bacteria, he said, included *Streptococcus pyogenes*, *Staphylococcus aureus*, *Diplococcus pneumoniae*, *Streptococcus viridans*, *Bacillus anthracis* and others, but the tubercle bacillus, coliform bacillus, *Proteus* and *Pseudomonas aeruginosa* were insensitive. Penicillin is nontoxic and is not inhibited by pus tissue autolysates, blood or serum. It is destroyed by acids and alkalis and, because of the hydrochloric acid in the stomach, cannot be given by mouth. It is rapidly absorbed from muscle and subcutaneous tissue. Rectal administration is ineffective, Professor Florey reported, because penicillin is destroyed by coliform bacilli. The dosage Professor Florey and his associates had used was 15,000 units every three or four hours. It was the only drug he knew of, he said, that gave no need to worry about overdose. The dosage mentioned would cure coccic septicemia. In local administration there must be adequate access to the infected parts. Professor Florey recently went to North Africa, where he cooperated with ten surgeons in the treatment of war wounds. They sewed up infected wounds and fractures, using penicillin locally and parenterally to prevent sepsis. Under ordinary conditions infection made closure of wounds older than six hours impracticable. He showed a film demonstrating the entire operation—from cleaning the limb with soap and water, trimming the skin edges and muscle, inserting tubes and closing the wound to the instillation of penicillin, which in some cases was repeated twice daily for five days. After ten days the stitches were removed. Out of 171 cases, complete union was obtained in 104, subtotal union in 60 and failure in 7. In some cases penicillin with sulfanilamide was blown on the wound.

Other speakers reported good results in the treatment of localized streptococcal and staphylococcal infection by direct application of penicillin. Bone infections, chronic sinuses, abscesses, arthritis, skin infections, infections of the eyes and lips, empyema, acute mastitis and acute infections of the hands have also been treated successfully, it was reported.

Col. Elliott C. Cutler, M. C., A. U. S., described 4 cases of severe fracture, 3 of the femur and 1 of the tibia and fibula, in which initial instillations were given of 10,000 to 20,000 units of penicillin solution. But in spite of continuous intramuscular applications of penicillin, gas forming organisms were detected in the wounds after three or four days and amputation was necessary. In all cases the condition of the patients was then satisfactory. Colonel Cutler felt that penicillin played a major part in the survivals. Gas gangrene antitoxin was also given. Subsequent speakers stressed the need for this.

Major J. N. Robinson, M. C., A. U. S., described the treatment of sulfonamide resistant gonorrhea with penicillin; 93 out of 95 patients were cured by a course of 100,000 units given in 15,000 unit doses every three hours. One of the 2 men not cured responded satisfactorily to a second course. Three patients with gonorrheal arthritis were also treated. One was

cured after 200,000 units of penicillin was given intramuscularly in 15,000 unit doses every three hours, but the others, who received only 100,000 units, were not cured.

Ban on Opium

The British government has decided to prohibit opium smoking in British and British protected countries in the Far East which are now occupied by the Japanese occupation. The countries chiefly affected are British Malaya, the Malay States and Hongkong. This step is the climax of a movement begun at the Hague International Conference of 1912, which gave rise to heated controversy with the United States. Thus a cause of disagreement is removed and a contribution is made to Anglo-American cooperation, particularly in the Far East. The final step from restriction to complete prohibition has been rendered possible because in China, from which much opium was smuggled into the territories mentioned, a vigorous campaign has been conducted by the present Chinese government against the cultivation and use of opium. At the stormy opium conference held at Geneva in 1924 and 1925 the American delegation sought to put an end to opium smoking by restricting production of the drug to scientific and medical needs. But there were practical obstacles, political and financial; among these were the production of opium for export by Chinese war lords, opposition by the poppy growing Persians and the fact that the administrations of Malaya and Hongkong derived substantial revenues from the opium monopoly. These considerations led the British and other governments to reject the American proposal, and the United States and China withdrew from the conference. Having rejected a measure which seemed impracticable, the British concentrated on control, but this did not satisfy the public conscience in this country. Fortunately the Chinese government, which refused to send delegates to the Bangkok conference of 1931, at last took active steps against opium smoking and production, while the Japanese army protected and exploited the trade.

Disease Follows Famine in Bengal

The Bengal government, with the assistance of the army, is engaged in fighting epidemics which have broken out in the wake of the Indian famine. Cholera alone has caused about 60,000 deaths during the sixteen weeks beginning July 10, a mortality of 60 to 70 per cent of the persons attacked. Besides cholera and intestinal disease due to unaccustomed foods, smallpox has broken out, and an unprecedented epidemic of malaria, including malignant forms of the disease, has appeared. An advance guard of army doctors, British and Indian, has taken the field to assist local health authorities. The Bengal government has also sanctioned the appointment for three months of 500 medical licentiates and 500 health assistants. It has also provided 24,000 pounds of quinine at controlled prices and 23,000 pounds for free distribution to malaria patients.

The government has taken means to combat famine by the importation of rice. Sir J. P. Srivasta, food member of the viceroy's council, has announced that every one from the viceroy down will be rationed as soon as a plan can be prepared. The central government is undertaking direct relief of victims of the Bengal famine.

Destruction of a National Library

Acting under orders, 600 German soldiers entered the Italian Royal Society's Library at Naples, soaked the shelves and books with gasoline, flung in hand grenades, and, having shot two guards who attempted resistance, kept the fire department at a distance while the library burned. About 200,000 volumes, including a most valuable collection of scientific periodicals and publications of learned societies throughout the world, were destroyed. The Germans also burned the great National Library at Naples. This contained over 1,000,000 volumes and

250,000 listed pamphlets, a collection of more than 4,000 incubula, many of them beyond price, 10,000 manuscripts and 11,000 autographs and autographed letters of famous people. One of the treasures of the Naples library was the unique collection of Greek and Roman papyri from Herculaneum. The Germans carried off what appealed to them and burned the rest. Other famous libraries have also been pillaged.

BRAZIL

(From Our Regular Correspondent)

Nov. 30, 1943.

Fingerprint Alterations and Clinical Dactyloscopy

With the recent publication of two papers on the pathology of fingerprints and dactylography, Dr. Leonidio Ribeiro of Rio de Janeiro and Dr. J. Paulo Vieira of São Paulo have brought to a successful conclusion the scientific work initiated by Israel Castellanos of Cuba, which proved that the patterns of the finger tip skin ridges formed by the dermal papillae are not immutable. In 1907 Dastre of the Academy of Medicine of Paris, seeking to appraise the several systems of human identification, advanced the value of fingerprinting, because, he said, the skin patterns of the finger tips are invariable from intrauterine life until after death. Professor Vervaeck of Brussels declared in 1908 that skin diseases and lesions such as herpes, eczema, impetigo and burns are able to modify the papillary patterns but only temporarily, since they are reestablished with the cure of these lesions. In his widely known *Treatise on Criminology* in 1931 Edmond Locard affirmed the principle of the immutability of the fingerprints and insisted on the point that they are not modifiable either pathologically or by the will of the individual himself. The first physician to point out that the fingerprints are modified by leprosy was Israel Castellanos of Cuba, who in 1923 proposed the use of the expression "clinical dactyloscopy" to characterize that branch of the study of fingerprints related to alterations of individual dactylograms in different diseases. Dr. Leonidio Ribeiro, professor of forensic medicine and director of the Rio de Janeiro Institute of Civil Identification, began in 1933 a series of researches to demonstrate the frequent alterations of the finger skin patterns as a consequence of lesions of traumatic or pathologic nature. In the first place, Dr. Ribeiro's work confirmed the findings of Castellanos regarding the alterations caused by leprosy and ascertained that these were caused by an abundant cellular infiltration of the derma, which contributed to shortening the height of the papillae. Further investigations showed that certain skin and nervous diseases lessen and even extinguish the papillary ridges—so much so that it is impossible to classify the fingerprint and so identify the individual. The most important scientific consequence of Dr. Ribeiro's findings was the possible use of analysis of fingerprint alterations for the diagnosis of some diseases, a fact which he announced when he began to notice the frequent occurrence of these alterations.

His recent paper includes several interesting cases of diseases discovered through the use of what he calls "dactylography." One of them is a case of leprosy discovered through study of the fingerprints alone. An illiterate Negro woman had been fingerprinted when opening an account in a savings bank in 1919. Fifteen years later, when she wished to withdraw her money, she had to be fingerprinted again, but she could not be identified as the true depositor because she presented a total destruction of the characteristic pattern of the papillary ridges. Dr. Ribeiro's help was requested to solve the difficulty, and he was so well acquainted with the picture presented by the fingerprints of leprosy patients that he immediately declared the woman leprosy without ever having seen her. The diagnosis was later confirmed by a specialist who recognized the patient as affected with leprosy. In another instance fingerprints taken recently at the Institute of Identification showed

a partial extinction of the papillary ridges in comparison with a former fingerprint filed at the institute ten years before. Although the man considered himself in good health, an examination demonstrated that he had a severe syphilitic infection, with a positive result for several serologic reactions and a characteristic buccal leukoplakia. Several other cases are described in Dr. Ribeiro's paper, presented with many illustrative documents under the title "Dactylography." Although these facts prove that the dogma of the immutability of the papillary patterns must be discarded, which may bring some practical difficulties, Dr. Ribeiro believes that on the other hand they will open new fields of use for this procedure as a distinct help to clinical medicine.

Dr. J. Paulo Vieira's monograph "Pathology of Fingerprints" shows that different physical and chemical actions are capable of so changing or disfiguring the papillary patterns that it is possible in several particular cases to state the occupation of a person by the analysis of fingerprints. This is clearly demonstrated by many illustrations included in the paper.

Caseosis in Leprosy

Dr. Eurico Branco Ribeiro recently reported to the Sociedade Paulista de Lepra a surgical study of nervous caseation in leprosy. The most frequent feature in leprosy is the rosary-like enlargement of the peripheral nerves. Sometimes, however, probably owing to a higher defensive power of the organism, the destruction of bacilli and formation of toxic substances lead to caseous necrosis of the nerves surrounded by granulomatous tissue. The area of caseosis gradually increases and involves nerves, perinerves, subcutaneous tissues and skin. The caseosis of the peripheral nerves in leprosy may be classified in four types. The first type includes cases in which the necrosis involves the skin. The second type includes cases in which there are multiple tumoral formations. The treatment in both these types is surgical removal of the nerve and necrotic tissues. The third group includes cases in which there is invasive necrosis of cutaneous branches of the peripheral nerves. The removal of the entire area is then necessary. In the fourth group, cases of smooth enlargement of the nerve, surgical therapy is limited to removal of the caseous material through an incision of the nerve.

Marriages

ROBERT VIVIAN EDWARDS to Miss June Olivia Ledyard DeWees, both of Coral Gables, Fla., November 18.

ERNEST W. FISHER, Bryson City, N. C., to Miss Mary Howard Crutchfield of Woodsdale, November 12.

RALPH BRETNEY MILLER, Washington, D. C., to Miss Anne Hetherington Upton of Mathews, Va., recently.

PERRY A. MORGAN JR., Ensley, Ala., to Miss Barbara Ruth Callaway of Birmingham, November 5.

HOWARD S. HUSSEY JR., Tarboro, N. C.; to Miss Jean Marie Miller of Hazelton, Pa., November 6.

THOMAS S. HARBIN, Rome, Ga., to Miss Margaret Foote Troutman of Atlanta, November 12.

ROBERT R. CROSS to Dr. Margaret M. Conlin, both of Toledo, Ohio, in Salina, Kan., November 5.

THOMAS PATRICK ALMY to Dr. Katharine Whitin Swift, both of New York, November 12.

HENRY GOUGH MONTGOMERY to Miss Martha Barlow, both of Dallas, Texas, November 5.

SAMUEL N. STONE JR., Ardmore, Okla., to Miss Love Porter of Oklahoma City recently.

EDWIN B. STROTHER to Mrs. Margaret Blackwell, both of Dallas, Texas, October 28.

PAUL D. OCHENRIDER, Wilkes-Barre, Pa., to Miss Ruth Ryce of Pittston, November 27.

LEONARD J. MCGEE to Miss Mabel Agnes Doyle, both of Philadelphia, recently.

Deaths

Armin Von St. George ☉ New York; Columbia University College of Physicians and Surgeons, New York, 1914; assistant professor of forensic medicine at the New York University College of Medicine; formerly instructor of pathology at his alma mater; specialist certified by the American Board of Pathology, Inc.; member of the American Association of Pathologists and Bacteriologists; member and past president of the American Society of Clinical Pathologists; a founder and vice president of the New York State Society of Pathologists; served in France during World War I and received two citations for distinguished service; served as assistant director of laboratories and pathologist, Bellevue Hospital; consulting pathologist, Medical Center of Jersey City, Jersey City, N. J.; on the staff of the Lenox Hill Hospital; in 1931 received from the Scientific Exhibit of the American Medical Association a silver medal for excellence of presentation of exhibit illustrating the effects of radium poisoning in the watch dial industry; author of "A Textbook of Pathology for Use in Schools of Nursing"; died November 20, aged 51, of cerebral thrombosis.

Frank A. Kelly ☉ Detroit; Detroit Homeopathic College, 1903; University of Michigan Homeopathic Medical School, Ann Arbor, 1919; president of the Wayne County Medical Society 1923-1924 and for many years treasurer of the society; formerly a member and president of the Michigan State Board of Registration in Medicine; fellow of the American College of Surgeons; a member of the founders group of the American Board of Surgery; veteran of the Spanish-American War; member, medical advisory board number 20, Selective Service; a member and past president of the city board of health; on the staffs of the Evangelical Deaconess Hospital, Receiving Hospital and the Highland Park (Mich.) Hospital; chief of staff, Grace Hospital; died December 10, aged 63, of left ventricular failure.

John Joseph Nutt ☉ New York; University of the City of New York Medical Department, 1897; Cornell University Medical College, New York, 1899; professor of orthopedic surgery at the New York Polyclinic Medical School and Hospital; specialist certified by the American Board of Orthopaedic Surgery, Inc.; member of the American Orthopaedic Association and the American Academy of Orthopaedic Surgeons; fellow of the American College of Surgeons; at one time superintendent of the New York State Reconstruction Home, West Haverstraw, N. Y.; served on the staffs of the Willard Parker Hospital, New York, Nyack Hospital, Nyack, Long Beach Hospital, Long Beach, the Summit Park Sanatorium, Pomona and the New York Polyclinic Medical School and Hospital, where he died November 16, aged 73, of cerebral hemorrhage and arteriosclerotic hypertensive heart disease.

Charles Wesley Martin ☉ Woodmere, N. Y.; Columbia University College of Physicians and Surgeons, New York, 1921; specialist certified by the American Board of Pediatrics, Inc.; past president of the Nassau County Medical Society; member and past president of the American Academy of Pediatrics; fellow of the American College of Physicians; consultant pediatrician, Long Beach Hospital, Long Beach, Meadowbrook Hospital, Hempstead and South Nassau Communities Hospital, Rockville Centre; attending pediatrician to St. Joseph Hospital, Far Rockaway, and the Nassau Hospital, Mineola, where he died November 16, aged 48, of bronchopneumonia.

John C. King ☉ Pasadena, Calif.; University of Nashville (Tenn.) Medical Department, 1874; fellow of the American College of Surgeons; one of the founders and past president of the San Bernardino County Medical Society; past president of the Riverside County Medical Society and the Southern California Medical Society; president of the California Medical Association in 1910; president of the high school board in Banning for twenty years; past president of the state board of medical examiners; at one time associated with the Indian Service; for many years surgeon for the Southern Pacific Railroad; died October 21, aged 90, of pneumonia.

De Witt Talmage Hunter ☉ Surgeon, Lieutenant Commander, U. S. Navy, retired, Washington, D. C.; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1918; U. S. Naval Medical School, 1931; commissioned a lieutenant (jg) in the medical corps, Naval Reserve Force, on May 3, 1918; became a lieutenant in the medical corps of the U. S. Navy on Aug. 3, 1920 and

a lieutenant commander on June 30, 1931; died in the Union Memorial Hospital, Baltimore, October 28, aged 54, of coronary thrombosis.

Orville Reid Allen ☉ Lake Stevens, Wash.; Rush Medical College, Chicago, 1887; past president of the Snohomish County Medical Society; died October 23, aged 78, of angina pectoris.

John Herbert Allin, Fishers, Ind.; Trinity Medical College, Toronto, Ont., 1896; died in Indianapolis November 22, aged 81, of bronchopneumonia and fractured right hip due to a fall.

William S. Bickham, San Saba, Texas; University of Texas School of Medicine, Galveston, 1903; died at Paint Rock in November, aged 67, of myocarditis.

Edward Arnold Burkhardt Sr. ☉ Kansas City, Mo.; University Medical College of Kansas City, 1900; an Affiliate Fellow of the American Medical Association; at one time adjunct professor of obstetrics at his alma mater; on the staffs of the Menorah and St. Luke's hospitals; formerly on the staff of the Kansas City General Hospital; died October 11, aged 66, of hepatic cirrhosis and carcinoma.

Eben Proctor Clapper, Waynoka, Okla.; Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1901; member of the Oklahoma State Medical Association; died November 28, aged 74, of cerebral hemorrhage and pneumonia.

Paul Baker Clayton, Kansas City, Mo.; University Medical College of Kansas City, 1907; served during World War I; died October 9, aged 67, of arteriosclerosis.

William F. Clevenger ☉ Indianapolis; Medical College of Indiana, Indianapolis, 1894; specialist certified by the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; served during World War I; lieutenant colonel in the medical reserve corps, U. S. Army, not on active duty; on the staffs of St. Vincent's, Methodist and City hospitals; died November 20, aged 69, of coronary thrombosis.

La Rue Colegrove, Elmira, N. Y.; University of Buffalo School of Medicine, 1887; also a pharmacist; member of the Medical Society of the State of New York; fellow of the American College of Surgeons; past president of the Chemung County Medical Society; for many years served on the city board of health; member of the board of managers of the Chemung County Sanatorium; consulting surgeon on the staff of the Arnot-Ogden Hospital, where he died November 11, aged 79, of virus pneumonia.

Lisle Leaholme Collins, Webster Groves, Mo.; St. Louis University School of Medicine, 1919; member of the Missouri State Medical Association; on the staffs of the Bethesda General Hospital, De Paul Hospital, Missouri Baptist Hospital and the Evangelical Deaconess Hospital, St. Louis, where he died October 14, aged 50, of embolism.

Annie G. Copeland, Wellesley, Mass.; College of Physicians and Surgeons, Boston, 1887; died September 6, aged 81, of hypertensive heart disease.

John S. Coughlan, Berkeley Springs, W. Va.; College of Physicians and Surgeons, Baltimore, 1908; also a druggist; died in the Washington County Hospital, Hagerstown, Md., November 17, aged 63, of injuries received in an automobile accident.

John H. Craven, Carl Junction, Mo.; Northwestern Medical College, St. Joseph, 1892; died October 27, aged 84, of chronic myocarditis.

Philip Henry Cronin, Houston, Texas; Tulane University of Louisiana School of Medicine, New Orleans, 1894; member of the State Medical Association of Texas; on the staff of St. Joseph's Infirmary, where he died November 10, aged 77, of coronary occlusion.

Howard Lewis Cushman ☉ Methuen, Mass.; Boston University School of Medicine, 1908; school physician; formerly member of the school committee and the board of health; member of the Selective Service System; died November 3, aged 57, of acute myocarditis and chronic interstitial nephritis.

Charles Albert Cutting, Tulare, Calif.; College of Medical Evangelists, Loma Linda-Los Angeles, 1940; diplomate of the National Board of Medical Examiners; commissioned a first lieutenant in the medical reserve corps, U. S. Army, on June 11, 1939 and dishonorably discharged on Oct. 10, 1942; died November 8, aged 32, of virus pneumonia.

Harry Preston Findley, Pasadena, Calif.; Rush Medical College, Chicago, 1899; at one time assistant superintendent of

the Massillon (Ohio) State Hospital; died October 29, aged 69, of coronary thrombosis.

Luther Wendall Fowler, El Dorado, Kan.; American Medical College, St. Louis, 1899; member of the Kansas Medical Society; on the staff of the Susan B. Allen Memorial Hospital; died October 18, aged 67, of carcinoma of the right lung.

Archibald E. Freer, Chicago; Rush Medical College, Chicago, 1891; died in the Augustana Hospital November 29, aged 81, of hypostatic pneumonia and acute cardiac failure.

Nicholas Amon Funderburk Ⓢ Union City, Tenn.; Emory University School of Medicine, Atlanta, 1922; member of the Medical Association of Georgia; died October 30, aged 48, of coronary disease.

Erwin Lowe Gill Ⓢ Shreveport, La.; Tulane University of Louisiana School of Medicine, New Orleans, 1926; fellow of the American College of Surgeons; member of the staffs of the Tri-State Hospital, T. E. Schumpert Memorial Sanitarium, Shreveport Charity Hospital and the North Louisiana Sanitarium; suffocated October 31, aged 41, when his home caught fire.

Andrew Roy Hackett, Detroit; Drake University College of Medicine, Des Moines, 1912; served on the staff of St. Mary's Hospital; died November 16, aged 65, of coronary occlusion and chronic myocarditis.

Luther Anderson Hedges, Watseka, Ill.; Chicago College of Medicine and Surgery, 1909; member of the Illinois State Medical Society; served on the staffs of the Kankakee State Hospital, Kankakee, and the Iroquois Hospital; died November 15, aged 68, of coronary occlusion.

Harry Graves Hinckley Ⓢ Merrill, Wis.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1898; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1902; served as a member of the local school board, Lincoln county physician and health officer for the city of Merrill; at one time chief of staff, Holy Cross Hospital; died November 11, aged 68, of cardiac deficiency, due to emboli in lung, following an automobile accident.

Vardry Amon Hutton, Florence, Colo.; Hering Medical College, Chicago, 1903; member of the Colorado State Medical Society; served as president of the Colorado Board of Medical Examiners; died October 15, aged 76, of coronary occlusion.

Leonidas B. W. Johnson, Ireland, Ind.; Hospital College of Medicine, Louisville, Ky., 1885; member of the Indiana State Medical Association; died in the Welborn-Walker Hospital, Evansville, November 15, aged 85, of pneumonia.

Frank Weaver Kern, Seymour, Ind.; Louisville (Ky.) and Hospital Medical College, 1908; served during World War I; formerly associated with the Veterans Administration in Cleveland and on the staff of the Veterans Administration Facility, Brecksville, Ohio; died October 29, aged 62, of aortic stenosis.

Fred Edward Koch, Burlington, Iowa; St. Louis College of Physicians and Surgeons, 1901; member of the Iowa State Medical Society; served as Des Moines county physician; died November 13, aged 65, of leukemia.

Otto Edward Kress Ⓢ Louisville, Ky.; University of Louisville Medical Department, 1921; died October 16, aged 52, of coronary occlusion.

Benjamin Harrison Lamb Ⓢ Cincinnati; University of Cincinnati College of Medicine, 1915; served during World War I; died November 16, aged 54, of cerebral hemorrhage.

Oscar O. Larsen Ⓢ Detroit Lakes, Minn.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1907; served as president and secretary of the Northern Minnesota Medical Association; physician for the county Selective Service Board and a member of the volunteer medical corps of the council of national defense during World War I; city health officer; on the staff of St. Mary's Hospital; died suddenly, November 7, aged 66, of coronary occlusion.

Murry Herman Levine, New York; Columbia University College of Physicians and Surgeons, New York, 1918; also a pharmacist; member of the Medical Society of the State of New York; fellow of the American College of Surgeons; formerly associate professor of otology at the New York Post-Graduate Medical School, Columbia University; on the staffs of the Harlem, Beth David and Beth Israel hospitals; died in the Barnes Hospital, St. Louis, November 19, aged 48, of bronchogenic carcinoma.

James Mary Joseph Allen Levins, Houston, Texas; Licentiate of the Apothecaries' Hall, Dublin, Ireland, 1913; at one time a medical officer in the British navy; died in the Hermann Hospital, November 10, aged 57, of diabetes mellitus.

Harold Barker Loughery, Muskegon, Mich.; University of Illinois College of Medicine, Chicago, 1922; member of the Michigan State Medical Society; president of the Muskegon County Medical Society; fellow of the American College of Surgeons; fellow in surgery at the Mayo Foundation, Rochester, Minn., from October 1927 until October 1930; on the staffs of the Mercy Hospital and the Hackley Hospital, where he died November 22, aged 47, of cerebral hemorrhage.

Lorne Taylor MacDougall Ⓢ Tunkhannock, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1919; served as medical director of Wyoming County; died September 5, aged 49.

John Joseph Madden, Brooklyn; Harvard Medical School, Boston, 1909; member of the Medical Society of the State of New York; also a pharmacist; specialist certified by the American Board of Otolaryngology; on the staffs of the Brooklyn Eye and Ear and St. Mary's hospitals, Brooklyn, and St. Vincent's Hospital, New York, where he died November 23, aged 61, of chronic coronary thrombosis.

Edward W. Martin, Kansas City, Mo.; University Medical College of Kansas City, 1901; member of the Missouri State Medical Association; served as local surgeon for the Missouri Pacific Railroad Company and the Chicago, Milwaukee and St. Paul Railroad; died in the Research Hospital November 9, aged 67, of cardiac failure and coronary occlusion.

Charles Ernest McNeil, Pennington Gap, Va.; Kentucky School of Medicine, Louisville, 1904; member of the Medical Society of Virginia; surgeon for the Louisville and Nashville Railroad; died October 26, aged 71.

James Herschel McNeill Ⓢ New Castle, Ind.; University of Nashville (Tenn.) Medical Department, 1906; at one time coroner of Morgan County; on the staff of the Indiana Village for Epileptics; died November 14, aged 63, of coronary disease.

Albert Baptiste McQuillan Ⓢ East St. Louis, Ill.; Washington University School of Medicine, St. Louis, 1903; past president of St. Clair County Medical Society; fellow of the American College of Surgeons; served during World War I; on the staff of St. Mary's Hospital, where he died November 12, aged 63, of myocarditis.

Theodore M. Moll, Detroit; Pulte Medical College, Cincinnati, 1891; served on the staff of the Monroe Hospital, Monroe, Mich., from 1924 to 1940; died November 20, aged 74, of arteriosclerosis.

George Roger Myers, Hurluck, Md.; University of Maryland School of Medicine, Baltimore, 1902; member of the Medical and Chirurgical Faculty of Maryland; on the associate staff of the Cambridge-Maryland Hospital, Cambridge, where he died October 7, aged 69, of cerebral hemorrhage.

Walter S. Nash, Knoxville, Tenn.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1889; member of the Tennessee State Medical Association; veteran of the Spanish-American War; medical examiner for the draft board during World War I; at one time alderman and councilman; served as chief of staff, Knoxville General Hospital; surgeon for the Southern Railway and the Louisville and Nashville Railroad; died November 13, aged 77, of pneumonia.

Little Berry Neal Ⓢ Jackson, Miss.; Memphis (Tenn.) Hospital Medical College, 1900; member of the Radiological Society of North America, Inc.; served during World War I; on the staff of the Mississippi Baptist Hospital, where he died December 1, aged 66, of coronary thrombosis.

Homer Lee Nickell, Morehead, Ky.; University of Louisville School of Medicine, 1910; served during World War I; formerly a member of the state legislature; died November 9, aged 57, of coronary occlusion.

Paschal J. Park, Cabot, Ark.; American Medical College, St. Louis, 1897; veteran of the Spanish-American War; died in the Army and Navy General Hospital, Hot Springs National Park, September 18, aged 76, of heart disease and generalized arteriosclerosis.

Douglas Amos Payne, Chicago; College of Physicians and Surgeons, Baltimore, 1887; member of the Illinois State Medical Society; at one time instructor in ophthalmology at the Illinois Medical College; died November 24, aged 86, of acute cardiac failure due to decompensated arteriosclerotic myocarditis.

Ewing Dwight Piper, Shadyside, Ohio; Starling Medical College, Columbus, 1905; member of the school board; died in the Martins Ferry Hospital, Martins Ferry, November 10, aged 65, of decompensated arteriosclerotic heart disease and cirrhosis of the liver.

James Albin Potts ☉ Pittsburgh; Western Reserve University Medical Department, Cleveland, 1879; died in the Shady-side Hospital November 15, aged 91, of cerebral hemorrhage.

Charles W. Ritter, McLean, Ill.; St. Louis University School of Medicine, 1903; member of the Illinois State Medical Society; member of the staff of St. Joseph's Hospital, Bloomington, where he died December 4, aged 66, of cerebral hemorrhage, arteriosclerosis and diabetes mellitus.

Frank Shackelford, Hope Hull, Ala.; Medical College of Alabama, Mobile, 1898; member of the Medical Association of the State of Alabama; died in the Fitts Hill Hospital, Montgomery, November 7, aged 75, of nephritis.

Joseph Lawrence Smith, Brooklyn; New York Homeopathic Medical College and Flower Hospital, New York, 1930; member of the Medical Society of the State of New York; died in the Adelphi Hospital November 12, aged 37, of a cerebral embolus following an appendectomy.

Matthew Thomas Smith, Chicago; Loyola University School of Medicine, Chicago, 1924; member of the Illinois State Medical Society; assistant clinical professor in surgery at his alma mater; senior on the surgical staff of the Mercy Hospital, where he died November 9, aged 45, of organic and rheumatic heart disease.

Archibald Alfred Southwick, Kendallville, Ind.; University of Wooster Medical Department, Cleveland, 1912; member of the Indiana State Medical Association; served with the American Expeditionary Forces during World War I; died in the McCray Memorial Hospital November 4, aged 58, of pneumonia.

Florence I. Staunton ☉ Peekskill, N.Y.;

Woman's Medical College of Pennsylvania, Philadelphia, 1905; an Affiliate Fellow of the American Medical Association; formerly on the staff of the Faxton Hospital, Utica; physician for St. Peter's parochial school; died in a Bangor, Maine, hospital October 16, aged 74, of coronary thrombosis.

Josiah S. Steiner, Bluffton, Ohio; Cleveland Homeopathic Medical College, 1898; served in France during World War I; died November 21, aged 71, of coronary disease.

William E. Stiles, East Northport, N. Y.; University of Pennsylvania Department of Medicine, Philadelphia, 1888; also a dentist; died recently, aged 79, of bronchopneumonia.

Gerald Hayden Stoner, Valparaiso, Ind.; American College of Medicine and Surgery, Chicago, 1905; at one time assistant professor of minor surgery at his alma mater; formerly served as county coroner and as a member of the city council; member of the board of education; on the staff of the Porter Memorial Hospital; died November 2, aged 69, of nephritis.

Walter Storm, Hope, N. J.; University of Pennsylvania Department of Medicine, Philadelphia, 1897; died October 29, aged 74, of chronic myocarditis, hypertension and gangrene of the right leg.

Lyman Beecher Swormstedt, Washington, D. C.; Hahnemann Medical College and Hospital of Philadelphia, 1877; one of the founders and for many years on the staff of the National Homeopathic Hospital; died November 11, aged 90, of carcinoma of the prostate and bladder.

George Gordon Taylor, Maywood, Ill.; Northwestern University Medical School, Chicago, 1902; died November 13, aged 73, of cerebral hemorrhage.

Wilbur Andrew Uehren ☉ Aurora, Ill.;

Rush Medical College, Chicago, 1901; at one time health commissioner of Aurora; on the staffs of the Copley Hospital, St. Charles

Hospital and St. Joseph's Hospital where he died November 20, aged 65, of myocardial infarction due to coronary occlusion.

Daniel Frederick Wallenfelsz, Pleasant City, Ohio; Starling Medical College, Columbus, 1902; member of the Ohio State Medical Association; a director of the Old Pleasant City Bank; died in St. Francis Hospital, Cambridge, November 23, aged 72, of uremia.

John Bunyan Walling, Binghamton, N. Y.; Long Island College Hospital, Brooklyn, 1892; on the staff of the Binghamton City Hospital; died November 18, aged 76, of cerebral hemorrhage.

William T. Whaley, Glenwood, Ark.; Memphis (Tenn.) Hospital Medical College, 1898; died in a Hot Springs National Park hospital November 26, aged 78.

William Norman Williams ☉ Tabor City, N. C.;

Medical College of Virginia, Richmond, 1924; owner of the Williams Clinic Hospital; died in the Columbus County Hospital, Whitesville, October 25, aged 46, of injuries received in an automobile accident.

Arthur L. Winston, Colorado Springs, Colo.; Memphis (Tenn.) Hospital Medical College, 1887; member of the Colorado State Medical Society; died October 31, aged 79, of senility.

Samuel Paul Wise ☉ Americus, Ga.;

Medical Department of Tulane University of Louisiana, New Orleans, 1911; member of the South-eastern Surgical Congress; fellow of the American College of Surgeons; served with the American Expeditionary Forces during World War I; at one time part owner of the Wise Sanitarium, Plains; visiting surgeon on the staff of the Americus City Hospital; died, November 3, aged 59, of cerebral hemorrhage.

George Lawrence Wolf ☉ San Francisco;

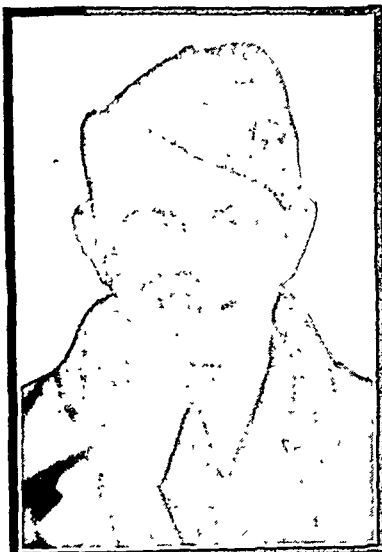
College of Physicians and Surgeons of San Francisco, 1917; on the staffs of St. Joseph's Hospital and the French Hospital, where he died recently, aged 61, of carcinoma of the pancreas with metastases.

George R. Wycoff, McKees Rocks, Pa.; Kentucky School of Medicine, Louisville, 1892; member of the Medical Society of the State of Pennsylvania; died in Pittsburgh November 4, aged 77, of acute heart disease.

KILLED IN ACTION

Robert Morton Fuller, New York; Emory University School of Medicine, Atlanta, 1939; began extended active duty as a first lieutenant in the medical reserve corps, U. S. Army, on July 16, 1941 and was assigned to the 51st Infantry, Fourth Armored Division at Pine Camp, N. Y.; promoted as a captain; reported missing in action Nov. 8, 1942; aged 28; officially declared dead by the War Department Nov. 8, 1943.

Aaron Sydney Michelson, Cincinnati; University of Cincinnati College of Medicine, 1941; served as chief resident of the Jewish Hospital and assistant clinician in general medicine at the Cincinnati General Hospital; lieutenant (jg), U. S. Naval Reserve; reported missing in action, Nov. 13, 1942, while a medical officer aboard the destroyer U. S. S. *Laffey* following the third battle of Savo Island; aged 28; officially declared dead by the Navy Department on Nov. 14, 1943.



CAPT. ROBERT M. FULLER
M. R. C., U. S. Army, 1915-1943



LIEUT. (jg) AARON S. MICHELSON
(N.C), U.S.N.R., 1915-1943

Correspondence

ORCHIECTOMY IN THE TREATMENT OF PROSTATIC CANCER

To the Editor:—Exception may be taken to two statements made by Dr. H. L. Kretschmer (THE JOURNAL, Nov. 20, 1943, p. 755) in the report of his interesting group of patients with cancer of the prostate treated by bilateral orchiectomy. Dr. Kretschmer states first, "There seems to be a prevailing notion that, once a diagnosis of cancer of the prostate has been made, all that is necessary to effect a cure is to perform an orchiectomy." All will admit that a notion is hardly a proper subject for scientific discussion. It is of interest to us that this notion is prevailing, but it is not clear among what group it is prevalent. Certainly not among those who have read and understood the literature, which is extensive, relating to castration for prostatic cancer. So far as I am aware, no one has made any claim that any patient has been cured of prostatic cancer by this operation in the reports from the many urologists who have used it. In all of the papers from this laboratory emphasis has been placed on the large number of "failure cases." Properly many years must elapse before a cure of cancer can be claimed, although several of our patients are free from clinical and chemical evidence of the disease more than four years after orchiectomy.

Dr. Kretschmer writes further "From a review of the table it is evident that the results are anything but desirable." This table summarizes the findings in 11 cases of prostatic cancer in which orchiectomy was performed; in 10 of them at some time, in addition, transurethral resection of the prostate was done, which in case 2 was omitted. It is true that the results obtained were not spectacularly good in this series; 3 of the patients died within eleven months after orchiectomy, and others obviously have an advancing carcinomatosis. No description is given of the weight or microscopic appearance of the testes or of titers of sex hormones excreted in the urine, so that it is impossible to say whether the excised glands were producing effective amounts of androgen in these cases; when the testes are physiologically atrophic, no benefit can be expected from orchiectomy. However, in the "report of cases" it may be gleaned that there was temporary bettering in 8 cases following orchiectomy, such as improvement in appetite, in gain of weight, in decreased pain or in sense of well being; only in cases 3, 5 and 8 apparently was there no improvement. Obviously prostatic resection contributed to some of the improvement, but in 1 of the cases in which temporary benefit was obtained, this was omitted. I agree that the results in this small series were not optimal but believe that it is unjustifiable to say that the effects are undesirable when improvement, even temporary, occurs from any treatment in advanced cancer.

Since the endocrine treatment of prostatic cancer by both orchiectomy and estrogen administration was introduced by C. V. Hodges and me (*Cancer Research* 1:293 [April] 1941) and since there seem to be misconceptions concerning its efficacy, it may be clarifying to state our present position (*Science* 97:541 [June 18] 1943): "It must be emphasized that the results are not uniformly successful and that they fall into three groups; one group, less than 5 per cent of patients received no or slight benefit from endocrine treatment; the other groups, larger and nearly equal in number, obtained respectively an improvement pronounced but unsustained (less than eighteen months) or a pronounced and more prolonged regression of the disease. The improvement is greater than palliation, when technically the patient is merely made more comfortable in the face of advancing disease. The benefit in prostatic cancer often includes disappearance of the tumor, at least in the gross, and is considered as neoplastic inhibition. In clinical patients, castration seems to give somewhat better results than occur from

estrogenic therapy." Dr. Richard Chute has ably presented a useful concept in stating that if nothing more was accomplished from the endocrine treatment of advanced prostatic cancer than a decrease of man-pain hours, which often occurs, the results would be clinically desirable at the present. Often greater benefits occur.

CHARLES HUGGINS, M.D., Chicago.

[NOTE.—The letter of Dr. Huggins was submitted to Dr. Kretschmer, who replies:]

To the Editor:—Dr. Huggins takes exception to my statement that there seems to be a prevailing notion that, once a diagnosis of cancer of the prostate has been made, all that is necessary to effect a cure is to perform an orchiectomy. I made this statement based on my personal experience with internists, surgeons, urologists and general practitioners who consulted me because of the failure of castration in their patients to effect a cure of cancer of the prostate. Several patients have consulted me for the specific purpose of having an orchiectomy, having been told by their physicians that such an operation would cure their cancer. Again, I wish to state that this is my personal experience.

As I stated in my paper, it is not my intention to belittle the extensive studies that have been done on this subject by the Gutmans, Huggins and others but simply to report my experience with this treatment for cancer of the prostate.

I agree with the statement of Dr. Huggins that the results obtained were not spectacularly good. As Dr. Huggins quite correctly stated, 3 of the 11 patients are dead. A review of the chart discloses that in 5 patients there is anything but betterment; 1 patient complains of pain in the hips and legs with swelling of the legs and loss of weight; 1 patient complains of moderate pain in the sacral region extending down the leg; in 1 patient there is no change in the leg pains; 1 patient is bedridden with a loss of weight and increase in the bone metastases and now requires frequent doses of morphine, and the fifth patient has painful urination with gross bleeding; 2 of the remaining 3 patients show improvement, and the third patient states that he "feels well." The orchiectomies on the 3 patients who show some improvement and a state of well-being are of recent origin, having been performed four, seven and eleven months ago.

I have undertaken no scientific research on the question of how or why physicians, surgeons, urologists and the public acquire the impression that orchiectomy cures cancer. This I leave to others.

HERMAN L. KRETSCHEMER, M.D., Chicago.

ELECTROCARDIOGRAPHIC CHANGES IN ABDOMINAL DISEASE

To the Editor:—In their article entitled "Changes in the Electrocardiogram Induced by Acute Pancreatitis" (THE JOURNAL, Dec. 4, 1943, p. 892) Gottesman, Casten and Beller emphasize the diagnostic value of the electrocardiogram in this condition. They conclude that electrocardiographic changes are one of a triad which "should establish the clinical diagnosis of acute pancreatitis." This conclusion implies a specificity for such electrocardiographic abnormalities which is at variance with the experience of others and myself and which is contradicted by the authors' recognition that "changes in the electrocardiographic pattern have been observed in a variety of abdominal conditions particularly with those associated with disease of the biliary system."

Fitzhugh and Wolferth (*Ann. Surg.* 101:478 [Jan.] 1935) have presented several cases with gallbladder disease exhibiting striking electrocardiographic abnormalities similar to those encountered by Gottesman and his collaborators, which disappeared following cholecystectomy. In 1938 during the tenure

of a fellowship in the cardiographic laboratory at the Mount Sinai Hospital in New York, I carried out a study in collaboration with Dr. Arthur M. Master on electrocardiographic changes following major abdominal surgery. Electrocardiograms were taken in a series of 23 cases before and during the operation, and daily postoperatively. Following a variety of abdominal operations, electrocardiographic changes occurred in 18 of 23 middle aged and elderly men. The most frequent changes were depression of the ST segments and inversion of T waves in any or all leads, abnormalities identical with those described by Gottesman and his associates in their cases of pancreatitis. These changes usually appeared during the first two days postoperatively and persisted for a varying time. The electrocardiogram in most cases reverted to its control preoperative appearance by the time of discharge from the hospital. These abnormalities occurred in normal subjects as well as in those with clinical or electrocardiographic signs of heart disease and bore no relation to the type of operation, anesthesia or operative shock. Changes occurred in cases in which the postoperative course was normal but tended to be more noticeable in subjects with severe postoperative complications. These observations do not confirm the "control" studies of Gottesman, Casten and Beller, in which the electrocardiogram was not interpreted as abnormal in any patients after extensive surgical procedures on the gastrointestinal tract.

It is noteworthy that postoperative electrocardiographic changes, although frequently profound, are not usually associated with any clinical evidence of cardiac involvement. Post-mortem examination in 3 cases we studied showed no evidence of recent myocardial damage, although definite depression of the ST segment and T wave inversions were present in 2 of these cases. In 3 of the cases of pancreatitis cited by Gottesman, Casten and Beller an electrocardiographic diagnosis of acute myocardial infarction was made which was not substantiated by clinical findings or autopsy (case 2). It is important that electrocardiographic findings of the type described by the authors and observed by Fitzhugh and Wolferth and by myself should not be mistaken for coronary closure. Differentiation from coronary occlusion is usually possible by the absence of Q wave patterns and elevated ST segments which are typically observed in acute coronary occlusion (Master, A. M.; Gubner, R. S.; Dack, Simon and Jaffe, H. L.: *Arch. Int. Med.* 67:647 [March] 1941). The elevated ST segment cited in case 6 presented by Gottesman and his associates was probably different in origin from the changes noted in their other cases. Such elevation of the ST segment in all leads is typical of pericardial involvement, and it was remarked that "the pericardial cavity contained 50 cc. of brownish red fluid." Cardiac involvement in this case was further evidenced by the presence of gallop rhythm.

These criticisms do not detract from the interest of the findings described by Gottesman, Casten and Beller. They do, however, indicate that little or no specific significance is to be attached to such electrocardiographic abnormalities and that, accordingly, the value of the electrocardiogram in the differential diagnosis of pancreatitis may seriously be questioned. Depression of the ST segment and T wave changes have been observed in a great variety of conditions. It is probable that more than one factor plays a part in their genesis in acute abdominal disorders, e. g. shock with attendant reduced coronary flow, serum electrolyte changes and viscero-cardiac reflexes. Depression of the ST segments and T wave changes merely indicate a metabolic disturbance in the myocardium, not necessarily irreversible. Such changes relate particularly to the subendocardial region of the left ventricle, which is most vulnerable to metabolic disturbances, for reasons presented elsewhere (Gubner, R. S., and Ungerleider, H. E.: *Arch. Int. Med.* 72:196 [Aug.] 1943).

RICHARD S. GUBNER, M.D., Brooklyn.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in *THE JOURNAL*, Jan. 1, page 57.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, Feb. 21-24. Sec., Dr. B. F. Austin, 519 Dexter Ave., Montgomery.

ARKANSAS: * March. Sec., Dr. D. L. Owens, Harrison.

CALIFORNIA: *Oral*. San Francisco, Jan. 20. Sec., Dr. Frederick N. Scatena, 1020 N St., Sacramento.

CONNECTICUT: * *Medical, Written*. Hartford, March 14-15. *Endorsement*. New Haven, March 28. Sec. to the Board, Dr. Creighton Barker, 358 Church St., New Haven. *Homeopathic*. Derby, March 13-14. Sec., Dr. J. H. Evans, 1488 Chapel St., New Haven.

DELAWARE: *Written*. Dover, Jan. 11-13. *Endorsement*. Dover, Jan. 18. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

FLORIDA: * Jacksonville, June 26-27. Sec., Dr. W. M. Rowlett, Box 786, Tampa.

IDAHO: Boise, Jan. 10. Dir., Bureau of Occupational Licenses, Mrs. Lela D. Painter, 355 State Capitol Bldg., Boise.

ILLINOIS: Chicago, Jan. 18-20. Supt. of Registration, Department of Registration and Education, Mr. Philip Harman, Springfield.

INDIANA: Indianapolis, May 2-4. Sec., Board of Medical Registration and Examination, Dr. W. C. Moore, 301 State House, Indianapolis.

KANSAS: Kansas City, Feb. 2-3. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. Seventh St., Kansas City.

MAINE: Portland, March 14-15. Sec., Board of Registration of Medicine, Dr. A. P. Leighton, 192 State St., Portland.

MASSACHUSETTS: Boston, March 14-17. Sec., Board of Registration in Medicine, Dr. H. Q. Gallupe, 413-F State House, Boston.

MINNESOTA: * Minneapolis, Jan. 18-20. Sec., Dr. J. F. Du Bois, 230 Lowry Medical Arts Bldg., St. Paul.

MISSOURI: *Reciprocity*. Jefferson City, Jan. 24. Sec., State Board of Health, Dr. James Stewart, State Capitol Bldg., Jefferson City.

MONTANA: Helena, April 3-5. Sec., Dr. O. G. Klein, First National Bank Bldg., Helena.

NEVADA: *Endorsement*. Carson City, Feb. 7. Sec., Dr. G. H. Ross, 215 N. Carson St., Carson City.

NEW HAMPSHIRE: Concord, March 9-10. Sec., Board of Registration in Medicine, Dr. D. G. Smith, State House, Concord.

NEW JERSEY: Feb. 15-16. Sec., Dr. E. S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO: * Santa Fe, April 10-11. Sec., Dr. LeGrand Ward, 141 Palace Ave., Santa Fe.

NEW YORK: Albany, New York, Buffalo and Syracuse, Jan. 24-27. Sec., Dr. R. R. Hannon, Education Bldg., Albany.

OREGON: * Portland, Jan. 26-29. Exec. Sec., Miss L. M. Conlee, 608 Failing Bldg., Portland.

SOUTH DAKOTA: * Pierre, Jan. 18-19. Dir., Medical Licensure, State Board of Health, Dr. Gilbert Cottam, Pierre.

WASHINGTON: * Seattle, Jan. 10-12. Dir., Department of Licenses, Mr. Thomas A. Swayze, Olympia.

WYOMING: Cheyenne, Feb. 7-8. Sec., Dr. M. C. Keith, Capitol Bldg., Cheyenne.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

CONNECTICUT: Feb. 12. Address State Board of Healing Arts, 250 Church St., New Haven.

DISTRICT OF COLUMBIA: Washington, April 17-18. Sec., Commission on Licensure, Dr. G. C. Ruhlman, 6150 E. Municipal Bldg., Washington.

FLORIDA: Gainesville, June 8. Sec., Dr. J. F. Conn, John B. Stinson University, DeLand.

IOWA: Des Moines, Jan. 11. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

MICHIGAN: Ann Arbor and Detroit, Jan. 14-15. Sec., Miss Eloise LeBeau, 101 N. Walnut St., Lansing.

NEBRASKA: Omaha, Jan. 11-12. Dir., Bureau of Examining Boards, Mr. Oscar F. Humble, 1009 State Capitol Bldg., Lincoln.

NEW MEXICO: Feb. 7. Sec., Miss Pia Joerger, State Capitol, Santa Fe.

OREGON: Portland, March 4. * Sec., Board of Higher Education, Mr. C. D. Byrne, University of Oregon, Eugene.

RHODE ISLAND: Providence, Feb. 16. Chief, Division of Examiners, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Venereal Diseases: Quarantine of Infected Person "Confined or Imprisoned in Any Municipal Prison."

Under a Florida statute a person confined or imprisoned in any municipal prison is subject to being examined and treated for venereal diseases by the health authorities or their deputies. Such a person found infected with venereal disease may be compulsorily detained and treated to prevent the dissemination of the infection. The state board of health is vested with authority to make rules and regulations concerning the isolation and treatment of persons infected with venereal diseases. Acting by virtue of this statute the state board of health adopted regulations, one of which authorizes the health officer to quarantine infected persons either on the premises in which they live or in any other place, hospital or institution in the jurisdiction that may have been provided, and, if no such place has been provided, confinement in the county or city jail under quarantine may be resorted to.

The petitioner, a woman, was charged with being drunk and disorderly and was confined in the county jail awaiting her trial before a justice of the peace, who set her appearance bond at \$500. While so confined she voluntarily submitted to a physical examination which indicated that she was infected with gonorrhea. Thereon the state health officer ordered her quarantined in the county jail pending transfer to one of the quarantine hospitals operated by the state board of health for the isolation and treatment of persons infected with venereal diseases. The petitioner then brought habeas corpus to secure her release from detention under the quarantine. The trial court denied the petition for a writ of habeas corpus and ordered that she remain under quarantine under the supervision of the state board of health for treatment for said disease until she was cured and that on her cure the court would then consider an application to reduce the bond on the charges pending before the justice of the peace. The petitioner then appealed to the Supreme Court of Florida.

The sole question presented concerned the validity of the state statute and the rules and regulations of the state board of health under which the petitioner was quarantined. Generally speaking, said the Supreme Court, rules and regulations necessary to protect the public health are legislative questions, and appropriate methods intended and calculated to accomplish these ends will not be disturbed by the courts. All reasonable presumptions should be indulged in favor of the validity of the action of the legislature and the duly constituted health authorities. But the constitutional guaranties of personal liberty and private property cannot be unreasonably and arbitrarily invaded. The courts have the right to inquire into any alleged unconstitutional exercise or abuse of the police powers of the legislature, or of the health authorities in the enactment of statutes or regulations, or the abuse or misuse by the boards of health or their officers and agents of such authority as may be lawfully vested in them by such statutes or regulations. However, the preservation of the public health is one of the prime duties resting on the sovereign power of the state. The health of the people has long been recognized as one of the greatest social and economic blessings. The enactment and enforcement of necessary and appropriate health laws and regulations is a legitimate exercise of the police power which is inherent in the state and which it cannot surrender. The constitutional guaranties of life, liberty and property, of which a person cannot be deprived without due process of law, do not limit the exercise of the police power of the state to preserve the public health so long

as that power is reasonably and fairly exercised and not abused. The legislative authority in this legitimate field of the police power, like as in other fields, is fenced about by constitutional limitations, and it cannot properly be exercised beyond such reasonable interferences with the liberty of action of individuals as are really necessary to preserve and protect the public health. It has been said that the test, when such regulations are called in question, is whether they have some actual and reasonable relation to the maintenance and promotion of the public health and welfare, and whether such is in fact the end sought to be attained. Every reasonable presumption must be indulged not only in favor of the validity of legislative action in this important field but also in favor of the validity of the regulations and actions of the health authorities. As was said in 12 R. C. L. 1271:

Health regulations are of the utmost consequence to the general welfare, and, if they be reasonable, impartial and not against the general policy of the state, they must be submitted to by individuals for the good of the public.

It might be noted, continued the court, that after making its order the trial court announced that when the petitioner was cured he would reduce the bond set by the justice of the peace in the criminal proceeding probably to one hundred dollars or some other nominal sum.

Apparently, while awaiting the decision of the Supreme Court in the appeal from the decision of the circuit court, the petitioner applied for a release on an appearance bond pending the disposition of the appeal. The Supreme Court denied that application without an opinion. It now undertook to state its reasons for that denial. Our view, said the court, was that the petitioner was being held under a quarantine order, which is not a criminal proceeding and hence is not bailable. As soon as the petitioner is cured and released from quarantine, the court below has very properly announced that she will be promptly released from custody on a nominal bail bond to appear and answer the minor criminal charge for which she was arrested. The constitution of this state guarantees the right to bail in criminal causes, with one exception, namely, in capital offenses where the proof is evident or the presumption great. The court then adverted to the fact that the object of bail in civil cases is either directly or indirectly to secure the payment of a debt or other civil duty. But those reasons calling for bail in criminal and civil causes do not apply to an instance in which a person is detained on a quarantine order. To grant release on bail to persons isolated and detained on a quarantine order because they have a contagious disease which makes them dangerous to others, or to the public in general, would render quarantine laws and regulations nugatory and of no avail.

For the reasons stated, the order of the trial court dismissing the petition for a writ of habeas corpus was affirmed.—*Varholj v. Swecat, Sheriff, 15 So. (2d) 267 (Fla., 1943).*

Society Proceedings

COMING MEETINGS

- Annual Congress on Industrial Health, Chicago, February 15-16. Dr. Carl M. Peterson, 535 N. Dearborn St., Chicago 10, Secretary.
- Annual Congress on Medical Education and Licensure, Chicago, February 14-15. Dr. Victor Johnson, 535 N. Dearborn St., Chicago 10, Secretary.
- American Academy of Orthopaedic Surgeons, Chicago, January 22-26. Dr. Myron O. Henry, 825 Nicollet Ave., Minneapolis, Secretary.
- Annual Forum on Allergy, St. Louis, Jan. 22-23. Dr. Jonathan Forman, 394 East Town St., Columbus, Ohio.
- Clinical Orthopaedic Society, Chicago, January 22-26. Dr. Myron O. Henry, 825 Nicollet Ave., Minneapolis, Secretary.
- Society of Surgeons of New Jersey, Atlantic City, January 29. Dr. Walter B. Mount, 21 Plymouth St., Montclair, N. J., Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1934 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Clinical Pathology, Baltimore 13:505-568 (Oct.) 1943

Cutaneous Anthrax: Pathologic Study with Clinical Correlation R. J. Lebowich, B. G. McKillip and Jane R. Conboy—p. 505.
Monocytic (Histiocytic) Leukemia in Relation to Previously Existing Sarcoma of Skin: Case Report B. Gueft and P. D. Roslin—p. 516.
Medicolegal Necropsy. C. A. Hellwig, B. C. Russum and R. W. Kerr.—p. 527.

American Journal of Orthopsychiatry, New York 13:571-760 (Oct.) 1943. Partial Index

Peace Aims. F. Alexander—p. 571.
Can We Build a Satisfactory Postwar World? G. Murphy—p. 581.
Objectives of Military Psychiatry. R. P. Kemble—p. 626.
New Approach to Multiple Personalities P. L. Harriman—p. 638.

American Journal of Surgery, New York 62:145-292 (Nov.) 1943

*Pelvicoscopic Method of Uterine Suspension W. B. Harrell—p. 149.
March Fracture or Insufficiency Fracture S. H. Nickerson—p. 154.
Treatment of Traumatic Bursitis by Internal Paracentesis E. Burgess—p. 165.
Simple Drainage of Intrathoracic Suppurations Use of Endocutaneous (Eloesser) Flap—p. 169.
*Effect of Orchiectomy and Stilbestrol in Carcinoma of Prostate C. C. Herger and H. R. Sauer—p. 185.
Surgical Problems in Tropics L. K. Stalker—p. 201.
Metal Shelf for Hip Dislocation R. Sutherland and M. J. Rowe Jr.—p. 206.
Omental Response: Observations on 160 Consecutive Autopsied Cases. R. E. Rothenberg and P. Rosenblatt—p. 211.
Rhinoplasty and Its Relation to Rhinology G. D. Wolf—p. 216.
*Regional Enteritis: Case Reports. L. S. Fallis—p. 225.
Refrigeration Anesthesia of Extremities Statistical Study S. T. Glasser and W. L. Mersheimer—p. 231.
Absorption Rates of Sulfanilamide: Observations Under Varying Pathologic Conditions B. I. Golden—p. 235.
Disappearance of Hemolytic *Staphylococcus Aureus* Septicemia Following Ultraviolet Blood Irradiation Therapy. Knott Technique G. Miley—p. 241.
*Traumatic Avulsion of Skin of Penis and Scrotum E. S. Judd Jr. and T. Z. Havens—p. 246.

Pelvicoscopic Method of Uterine Suspension.—Harrell describes a new instrument which will allow the surgeon a direct visualization of the pelvic viscera without performing a laparotomy. He also shows how the Gilliam type of uterine suspension may be performed without open abdominal incision, by use of the pelviscope and special round ligament hook instrument. By performing this operation without open abdominal incision the patient may become ambulatory the first post-operative day and the period of hospitalization is reduced to one or two days.

Orchiectomy and Diethylstilbestrol in Carcinoma of Prostate.—During the past twelve months Herger and Sauer have carried out castration or diethylstilbestrol treatment or both on 82 patients with carcinoma of the prostate who were studied for a period of from three to twelve months. Sixty of the 82 patients were given diethylstilbestrol medication alone. Orchiectomy alone was carried out on 3 patients, and castration either preceded or followed by diethylstilbestrol was performed on the remaining 19 patients. Since 50 per cent of the patients receiving diethylstilbestrol exclusively responded with regression or softening of the prostate, the authors believe that estrogen administration without castration should have its place in selected cases of prostatic cancer. An indication for such treatment is present in patients (1) with operable carcinoma of the prostate who refuse radical operation, (2) with moderately advanced lesions who have little or no symptoms, (3) with comparatively low grade, malignant, well differentiated adenocarcinoma in whom progression of the lesion is slow, or (4)

who refuse castration or for whom orchiectomy is contraindicated. It is necessary to carry out reexaminations at frequent intervals, and castration should be carried out as soon as there is increase in size of the prostate with progressive infiltration into the pelvis, development of obstructive symptoms, increase in the serum acid phosphatase activity and other symptoms which suggest metastatic spread of the disease. Castration should be recommended for all patients with prostatic cancer in whom metastases are demonstrable and for patients with a type of lesion which has a tendency to rapid progression. In addition, castration should be carried out on patients who do not respond favorably to diethylstilbestrol administration. The value of combined diethylstilbestrol medication and orchiectomy is undecided. Although favorable results have been accomplished in numerous cases, the authors do not believe that castration or diethylstilbestrol treatment will result in cures. However, this method yields far more favorable results than palliative irradiation. Neither castration nor diethylstilbestrol treatment can replace surgical removal of cancer of the prostate in patients in whom the prostate is still encapsulated.

Regional Enteritis.—Fallis says that among the 180,000 patients admitted to the Henry Ford Hospital during the period between 1933 and 1943 there have been 27 patients who had regional enteritis as proved by operation and an additional 5 diagnosed on the basis of history and x-ray examination but not yet operated on. The author reviews observations in these 32 cases. He gained the impression that regional enteritis is on the increase and that it is more frequent in male than in female subjects, the ratio being about 4:3. Eighty per cent of the patients were under 40 years of age. Thirteen (40.7 per cent) of the 32 patients had previous appendectomy. One patient presented a massive intestinal hemorrhage as the principal symptom. A correct preoperative diagnosis was made in only one third of the patients. Resection is the operation of choice. The surgical mortality was 6.7 per cent. The terminal ileum was involved in 90 per cent of the cases. Thirty per cent of the patients on whom resection was performed had a recurrence and required subsequent resection.

Traumatic Avulsion of Skin of Penis and Scrotum.—Judd and Havens show that traumatic avulsion of the skin of the penis and scrotum is often caused by farm machinery. The usual history is that the patient's overalls have become enmeshed in the gears of the combine thrasher, and before the machinery can be stopped the clothing has engaged the pubic hair and avulsion of the skin has occurred instantly. Surgical restoration in these cases is now readily accomplished with modern methods of skin grafting, especially since the advantages of the Padgett dermatome have been proved decisively. The element of pressure on the grafted zone cannot be overemphasized. This may be obtained satisfactorily by a "doughnut dressing" cut from sponge rubber blocks and bound snugly in place with a roll of gauze. The observation was made that the catheter may not be quite as essential as it formerly was supposed. Recently patients have been able to do without the catheter early, and the consensus is that in cases observed in the future the catheter can be removed early. The point has been made that the tube acts as an extension mechanism for the penile shaft, but the proper application of the graft and the dressings may make this element superfluous. Therapeutic doses of chemotherapeutic drugs have been instrumental in overcoming sepsis of the traumatized tissue. If the patient is not seen immediately, it is well to employ sulfonamides in the preparatory period. The authors review 9 cases observed at the Mayo Clinic.

Annals of Allergy, Minneapolis

1:1-90 (July-Aug.) 1943

Army Allergy Report on Allergy Clinics in Fourth Service Command S. W. French and L. J. Halpin—p. 1.
Possible Etiology of Appendicitis L. O. Dutton—p. 17.
Deallergization versus Hyposensitization E. Urbach and P. M. Gutt—p. 27.
Some of Factors to Be Considered in Etiology of Bronchial Asthma Tentative Classification E. A. Brown and P. L. Goetten—p. 33.
Vernal Conjunctivitis (Spring or Vernal Catarrh). S. Marten—p. 39.
Empirical Formula, Structural Formula and Molecular Weight of the Major Antigen in Crude Ragweed Pollen Extract G. E. Peck—p. 43.
Voids and Their Relation to Allergy Committee of Allergists for the Study of the Unknown Causes of Hay Fever and Asthma—p. 52.

Archives of Neurology and Psychiatry, Chicago

50:499-632 (Nov.) 1943

- *Effect of Various Sulfonamide Compounds on Nerve Regeneration. W. S. Hammond, J. F. Nonidez and J. C. Hinsey.—p. 499.
- Acute Arrest of Cerebral Circulation in Man. R. Rossen, H. Kabat and J. P. Anderson.—p. 510.
- Changes in Electroencephalogram Following Metrazol Shock Therapy: Quantitative Study. J. R. Knott and J. S. Gottlieb, H. H. Leet and H. D. Hadley Jr.—p. 529.
- Changes in Electroencephalogram Following Insulin Shock Therapy: Quantitative Study. J. R. Knott and J. S. Gottlieb.—p. 535.
- Quantitation of Muscular Function in Cases of Poliomyelitis and Other Motor Nerve Lesions: Electrical Excitability Tests and Electromyographic and Ergographic Studies. R. S. Schwab, A. L. Watkins and Mary A. B. Brazier.—p. 538.
- Cerebral Arteriovenous Oxygen Difference: I. Effect of Age and Mental Deficiency. H. E. Himwich and J. F. Fazekas.—p. 546.
- Reticulum Cell Sarcoma of Brain. T. D. Kinney and R. D. Adams.—p. 552.
- Atherosclerotic Myelopathy with Syring Formation: Differentiation from Other Types of Syringomyelia. C. Davison, S. Brock and S. P. Goodhart.—p. 565.
- Diffuse Leukoencephalopathy without Sclerosis: Clinicopathologic Study of New Form with Comment on Various Types of So-Called Diffuse Sclerosis and Schilder's Disease. H. Josephy and B. W. Lichtenstein.—p. 575.
- General Principles of Autonomic Innervation. O. R. Langworthy.—p. 590.

Effect of Sulfonamide Compounds on Nerve Regeneration.—Hammond and his collaborators designed experiments to determine the local effects of the sulfonamide drugs following simple nerve section, primary suture and suture delayed five days after the injury. The 58 cats used were killed at intervals of two, five, ten, fifteen and thirty days after the operation. Alternate longitudinal sections and cross sections of the nerve were stained by a modification of the Bodian silver method for nerve fibers, the hematoxylin and eosin method, Masson's trichrome technic and a silver impregnation method for argyrophilic and collagenous connective tissue. The regeneration of nerve fibers did not vary from the usual pattern in the presence of the sulfonamide compounds. Sulfanilamide, sulfathiazole, sulfapyridine and sulfadiazine do not appear to exert any chemical influence on the nerve regeneration. If these drugs are not rapidly absorbed they may offer a mechanical hindrance to the passage of regenerating fibers. The microscopic appearance of the sectioned nerve is a typical acute inflammatory reaction followed by reparative fibrosis. A typical foreign body reaction follows introduction of a sulfonamide compound into the wound except in the case of sulfanilamide, which is rapidly absorbed. The new nerve fibers are of small and medium size. Thick axons do not regenerate as such but produce a variable number of small and medium size fibers. The new fibers do not penetrate the old myelin sheath pathways but pass down beside them, presumably in a schwannian syncytium or between the sheaths of the endoneurium. A definite schwannoma was not observed. Primary suture of a nerve offers the best prognosis.

Archives of Otolaryngology, Chicago

38:413-540 (Nov.) 1943

- *Trauma of Larynx. C. Jackson and C. L. Jackson.—p. 413.
- Prostigmatic Therapy of Atrophic Rhinitis. R. Henner and W. Busby.—p. 426.
- Pathway of Tonsillar Lymphocyte. G. Kelemen.—p. 433.
- Use of Diathermy in Submucous Resection. A. C. Jones.—p. 445.
- Clinical Evaluation of Tenderness of Mastoid. H. Rosenwasser.—p. 447.
- Quantitative Tubal Function. H. B. Perlman.—p. 453.
- Voice Production and Laryngologist. W. A. C. Zerkli.—p. 466.
- Anatomy of Tracheobronchial Tree from Bronchoscopic Standpoint: Study of Twenty Pairs of Lungs; Preparation of Lungs for Demonstration. E. W. Hagens.—p. 469.
- Functional Anatomy of Eustachian Tube. C. S. Simkins.—p. 476.
- Ludwig's Angina: Anatomic Study of Role of Lower Molar Teeth in Its Pathogenesis. K. Tschiasny.—p. 485.
- Tumors of Nose and Throat. G. B. New and E. L. Foss.—p. 505.

Trauma of the Larynx.—The Jacksons present the results of clinical observations on industrial, criminal, accidental and suicidal trauma of the larynx. So important is trauma of the larynx in the treatment of injuries of the neck that such injuries might well be divided into two classes according to whether the larynx is involved or not. Tracheotomy may be necessary for emergency control of cervical hemorrhage even in the absence of dyspnea. By enabling cannular maintenance of airway it permits compression in the neck to serve in emergency control

of hemorrhage. Endolaryngeal hemorrhage can be controlled by tracheotomy followed by direct laryngoscopic packing of the larynx. Tracheotomy, done early and low, is indicated in almost all cases of endolaryngeal trauma. In lacerated wounds of the neck involving the larynx the following points are important: (a) A cannula should not be worn in the wound more than a few hours if at all. To avoid this, low tracheotomy should be done at the earliest possible moment. (b) Débridement within the larynx is contraindicated. (c) The cervical wound should not be completely closed; a large channel down to the larynx should be packed open until perichondritis and chondral necrosis are controlled. (d) The laryngeal cartilage should not be stitched. (e) When the food passages are opened, a feeding catheter should be worn through the nose until the food passages are repaired by plastic or other methods; prevention of dehydration is even more important than feeding in these cases. (f) If sulfonamide compounds are to be used locally in cervical wounds with openings into the air or food passages, such openings should be momentarily closed with a pad of gauze to prevent entrance of excessive amounts of the drugs. In laryngeal fractures and crushes a core mold should be inserted immediately or within a few days to serve as an internal splint to maintain a good lumen and restore form. Usually their use can be commenced within a week or two after the occurrence of trauma. Pneumonia and edema of the lungs are rare complications. The signs on which such diagnoses have been based disappeared in most cases after bronchoscopic aspiration of obstructive secretions. Psychic trauma with vocal manifestations is curable by psychic treatment.

Canadian Journal of Public Health, Toronto

34:433-480 (Oct.) 1943

- Firm Foundations First. V. R. Smith.—p. 433.
- *Influenza Among Immunized and Unimmunized Populations in 1943. R. Hare, Dorothy M. Stamatis and Jocelyn Jackson, with assistance of C. E. Dolman, P. L. Rentiers, P. W. Hudson and C. R. Donovan.—p. 442.
- *Influenza and Similar Respiratory Infections in Military Camp Over Period of Three Years. R. Hare, J. Hamilton and W. R. Feasby.—p. 453.
- National Physical Fitness Act. J. J. Heagerty.—p. 465.
- Experiment in Tuberculosis Control. J. V. Riches.—p. 470.

Influenza Among Immunized and Unimmunized Populations.—Hare and his collaborators say that groups of persons had been immunized with concentrated influenza A vaccine in various centers across the dominion of Canada from November 1942 through January 1943. The vaccine consisted of a tenfold concentrate of influenza A virus which had been grown in the allantoic fluid of the developing egg. An equal number of volunteers were given two doses of 1 cc. of saline solution to which had been added sufficient solution of formaldehyde to make the injections about as painful as those in which vaccine was injected. The volunteers were under the impression that two varieties of vaccine were being compared. All those who received the injections were asked to report any form of upper respiratory tract infection during the subsequent three months, or until the end of March. The standards adopted in the various centers varied somewhat. In Toronto and Edmonton, every case of upper respiratory tract infection, no matter how trivial, was studied. In Winnipeg and Vancouver, however, only cases of an influenzal nature were studied, those who merely had what appeared to be common colds being neglected. The studies were originally started in the hope of determining whether human beings immunized against influenza A were protected against infection with that virus. In view of the almost complete absence of influenza A in any of the centers where such immunization had been carried out, this question must remain unanswered. An epidemic of rather a mild character and somewhat atypical in symptoms did make its appearance in which serologic evidence indicated that about 23 per cent of the cases were due to influenza B. The incidence of influenza B in both immunized and control groups was approximately equal. No clinical differences between the cases diagnosed as influenza B and the remainder could be detected.

Respiratory Infections in a Military Camp.—The outbreaks studied by Hare and his associates comprise a relatively severe epidemic of the winter of 1940-41, one mild epidemic in the autumn of 1941 and three separate epidemics during the

winter of 1942-43. All occurred in Camp Borden. For the isolation of virus, the patient either gargled about 10 cc. of saline solution or had a similar quantity instilled into the nose by means of a rubber tube. Blood was taken as soon as possible after admission and again during convalescence. The titer of the neutralizing antibody of these serums was determined for influenza A and B viruses either by neutralization tests in mice or by the inhibition of agglutination of red cells. The first epidemic, that of 1940-41, was part of the widespread epidemic in which some cases were due to influenza A but with no identifiable agent responsible for the remainder. The epidemics in the succeeding year were not studied as completely as was desirable, but the wave studied was not due to influenza A or B. During 1942-43 there were three separate waves, each apparently due to something different. The first was undoubtedly not due to influenza A or B and no etiologic agent has been identified. About one fourth of the cases showed signs of lung involvement. This complication did not differ from the disease which has been reported as virus pneumonia, pneumonitis or primary atypical pneumonia of unknown origin. The second wave, in February 1943, was part of a widespread epidemic which appeared at various centers across the dominion. About 23 per cent of the cases were probably due to influenza B virus as judged by serologic tests. Actual isolation of influenza B was not achieved. The third wave was evidently due to influenza A. The first epidemic coincided with the usual outbreak of autumn colds, and a high proportion of patients suffered from what appeared to be a common cold for a day or two until the more acute symptoms set in. The symptoms which justified admission to the hospital may not have been quite typical of influenza; but as there were backache, headache and a short, sharp febrile illness in about 76 per cent of the cases it would be quibbling to describe the disease as anything but influenza. The remaining 24 per cent had the same general signs and symptoms but in addition developed signs in the lungs sufficient to justify the diagnosis of primary atypical pneumonia. There was close relationship between the patients who developed pneumonia and those who did not. It seems reasonable that the same etiologic agent was responsible for the infection in the two groups. A similar syndrome was seen in the second wave with about the same proportion of patients developing signs of lung involvement. There is little doubt that the connection between the common colds, influenza, febrile catarrh and primary atypical pneumonia, which occurred in the two waves, was due to a common etiologic agent in the waves. In the case of the first, this must still remain conjectural. But in the second wave a proportion of the patients were presumably infected with influenza B, some with A and two with both A and B, the remainder being also of unknown causation. The question arises whether all the patients were infected with the unknown agent, but some had a complicating infection with A or B viruses, whether the three agents influenza A, influenza B and the unknown agent were at work at the same time, each causing its own proportion of infections, or whether all the cases were due to influenza B but some failed to respond serologically. With the available evidence it is not possible to answer these questions.

Gastroenterology, Baltimore

1:911-994 (Oct.) 1943

*Prompt Feeding Program for Bleeding Gastric and Duodenal Ulcer: Report on 2,111 Collected Cases, Including 75 Personally Observed. E. A. Rasberry Jr. and T. G. Miller.—p. 911.

*Congenital Megacolon: Favorable End Results of Treatment by Resection. F. Whitehouse, J. A. Bargen and C. F. Dixon.—p. 922.

Gallstone Ileus: Successful Treatment with Miller-Abbott Tube. F. M. Owens Jr.—p. 938.

Review of Gastroenterologic Diagnostic Roentgenologic Literature for Year 1942. F. J. Rigos and B. R. Kirklin.—p. 942.

Malignant Argentaffinoma of Ileocecal Valve. A. Korkosz.—p. 961.

Immunizing Effect of Anti-Ulcer Factor in Normal Human Urine (Anethone) Against Experimental Gastrojejunal (Peptic) Ulcer in Dogs. D. J. Sandweiss.—p. 965.

Relation Between Nutritional Hydration and Contents of Fasting Stomach While Fasting One Day per Week. F. Hoelzel.—p. 970.

Prompt Feeding Program for Bleeding Ulcer.—Rasberry and Miller present an analysis of 2,111 cases of grossly bleeding gastric and duodenal ulcer, including 75 personally observed, all treated with the prompt and frequent feeding

program as popularized by Meulengracht. The fundamental element of this treatment is prompt and frequent feeding. The feedings usually consisted of milk products, eggs, gelatin preparations, cereals, puréed vegetables and cooked fruits administered at least six times a day. Ground meats were often added after a few days. It has been generally unnecessary to make use of alkaline medication, though it has been used in some instances. Opiates have been avoided. To overcome shock an adequate fluid intake was urged. Transfusions have been given without hesitation. There was a gross mortality of 4 per cent and a net or corrected mortality of 1.9 per cent. The authors think that, except when coincidental perforation has occurred, better results, both as to the survival of the patient and as to his comfort during the period of his illness, are obtained by this regimen than by any other form of conservative treatment or by surgical intervention.

Resection in Congenital Megacolon.—Whitehouse and his colleagues gathered 29 cases of congenital megacolon or Hirschsprung's disease from the records of the Mayo Clinic between the years 1909 and 1941. Twenty-four of the 29 patients were males; that is, the ratio of males to females was about 5:1. Twenty-seven of the 29 patients had had severe obstipation since birth or infancy. The remaining 2 patients had had intestinal symptoms for several years. Subtotal colectomy was performed in all of the 29 cases. Seven, or 24.1 per cent, of the patients died as a result of the operation. It has been stated repeatedly that patients who are less than 3 or 4 years of age withstand surgical treatment poorly. This holds true for sympathectomy as well as for subtotal colectomy. Three of the 7 patients who died were less than 3 years of age. Every effort should be made to avoid surgical treatment until these patients become older. A follow-up study on the patients who survived the operation disclosed that the results of subtotal colectomy are long lasting and that few complications occur. Subtotal colectomy is the treatment of choice in cases of segmental congenital, idiopathic megacolon, in cases in which megacolon does not respond to sympathectomy or to medical treatment, and in cases in which it is due to chronic mechanical obstruction. Subtotal colectomy also is the treatment of choice in severe megacolon when the patients are males. Unless indicated by an emergency condition, subtotal colectomy is contraindicated in megacolon when the patients are infants.

Georgia Medical Association Journal, Atlanta

32:317-354 (Oct.) 1943

Virus Pneumonia. C. B. Fulghum.—p. 317.

Electrocardiogram: Its Indications and Limitations. R. B. Logue.—p. 321.

Weak Points in Medical Approach to Nutrition Problem. E. R. Watson.—p. 325.

Foods in Wartime. Susan Mathews.—p. 329.

Diverticula of Esophagus: Report of Case and Comment on New Surgical Approach. J. W. Turner.—p. 334.

Priority of Murray-Nelson-Hulsman Original Method for Avoiding Perforation in Submucous Resection. R. M. Nelson.—p. 338.

Tetanus Following Intestinal Surgery. G. W. Fuller and A. H. Letton.—p. 339.

Journal of Nervous and Mental Disease, New York

98:343-456 (Oct.) 1943

Physiology of Spinal Cord: II. Influence of Chordotomy on Existing Motor Disturbances. O. R. Hyndman.—p. 343.

Neuropsychiatric Perspectives. E. A. Strecker.—p. 359.

Physiology of Schizophrenic Thinking. G. Bychowski.—p. 368.

Torquato Tasso, Eugene Delacroix, Johann Wolfgang von Goethe: Psychiatric Study. H. Stanka.—p. 387.

Spontaneous Reactions to Metrazol Therapy. L. Kerschbaumer.—p. 390.

Attitude of Psychoneurotic Toward Scientific Contraceptive Advice: Further Study. J. H. Friedman.—p. 396.

Maine Medical Association Journal, Portland

34:189-208 (Oct.) 1943

Cerebellar Astrocytoma, with Report of Case in 12 Year Old Girl. T. D. Pratt and A. H. McQuillan.—p. 189.

34:209-230 (Nov.) 1943

Discussion and Case Report on Myasthenia Gravis. G. Geyerhahn.—p. 209.

Pfeiffer Bacillus Meningitis: Review of Cases Treated by Chemotherapy; Report of Case Treated with Sulfadiazine and Immune Serum with Recovery. C. W. Steele.—p. 212.

New Jersey Medical Society Journal, Trenton

40:379-412 (Oct.) 1943

- *Observation on 1,200 Cases of Obesity Treated with Amphetamine (Benzedrine) Sulfate. S. W. Kalb—p. 385.
Trend of Industrial Medical Practice. E. W. Probst—p. 388.
Study of Case Histories of Fifteen Soldiers Admitted to Mental Hospital After Discharge from United States Army. L. Reznikoff—p. 391.
Dr. William McKissack, New Jersey Army Physician with General Washington. Mildred V. Naylor—p. 396.

Obesity Treated with Amphetamine Sulfate.—Kalb reports that 1,200 patients ranging in age from 12 to 63 years who were 10 to 124 per cent overweight were given amphetamine (benzedrine) sulfate. One hundred obese persons who did not receive medication served as a control group. Ten mg. of the drug was given daily; this was gradually increased to 20 or 30 mg. a day. In addition, a high protein diet ranging from 800 to 1,500 calories was prescribed. The average decrease in body weight was 26.4 pounds over a period of 11.2 weeks. The least amount of amphetamine sulfate used by any 1 patient was 70 mg. and the greatest quantity ingested was 5,030 mg. The average weekly loss in weight per patient was 2.4 pounds. In the control group the average period on the diet was 5.8 weeks, with an average weight loss of 22 pounds a week. Fifty patients who had been reduced to normal were placed on a maintenance diet ranging from 1,800 to 2,200 calories for a period of four weeks. Each patient received 20 mg. of amphetamine sulfate daily to determine if weight loss would result from the use of this drug alone. These patients failed to show any weight loss; in fact, each gained from 1 to 8 pounds (0.5 to 3.6 Kg.). Amphetamine sulfate has little or no effect on the blood pressure of obese patients with normal or elevated arterial tension. The pulse rate showed an increase in 26 per cent and a decrease in 8 per cent of the patients. The appetite was inhibited in approximately 40 per cent of the obese patients receiving amphetamine sulfate. The basal metabolic rate is not influenced by amphetamine sulfate in the doses given. The ingestion of amphetamine sulfate as such does not cause loss in body weight.

Ohio State Medical Journal, Columbus

39:985-1088 (Nov.) 1943

- Neglected Aspects of Office Gynecology. L. H. Biskind—p. 1001.
French Method of Reducing Subluxation of Shoulder. K. Hale—p. 1006.
Removal of Glass Drinking Tube from Abdominal Cavity. Case Report. A. H. Kanter—p. 1008.
Necrobiosis Lipoidica Diabeticorum. L. C. Goldberg—p. 1009.
Relapsing Fever in Korea. A. I. Ludlow—p. 1011.
Pseudocysts of Pancreas. Report of 3 Cases. R. G. Stoll—p. 1014.
Necropsy. Incidence of Carcinoma of Lung. E. K. Johnson and H. L. Reinhardt—p. 1017.
Importance of Arteriovenous Anastomoses. Renal Circulation After Compression of Renal Artery According to Method of Goldblatt. Study of Influence of Renal Venous Run Off on Experimental Hypertension. F. P. Corrigan and I. Pines—p. 1019.
X-Ray Therapy of Benign Uterine Bleeding and Fibromyoma. S. J. Tamarkin—p. 1023.
Postpartum Pulmonary Embolism. Problem of Femoral Vein Ligation as Prophylactic Measure. L. W. Whiting—p. 1027.
Localized Outbreak of Asiatic Cholera in 1834. S. R. Williams—p. 1029.

Physiological Reviews, Baltimore

23:305-380 (Oct.) 1943

- Selenium Poisoning. A. L. Moxon and M. Rhian—p. 305.
Biochemical Problems of Chemoautotrophic Bacteria. C. B. van Niel—p. 338.
Interrelations Between Thyroid Function and Vitamin Metabolism. V. A. Drill—p. 355.

Public Health Reports, Washington, D. C.

58:1573-1604 (Oct. 22) 1943

- The Physically Handicapped. B. D. Karpinos—p. 1573.

58:1605-1640 (Oct. 29) 1943

- Surveys of Milk Laboratories in War Areas in United States. I. Practices Observed in Making Agar Plate Counts. L. A. Black—p. 1605.
*An Outbreak of Dermatitis from Hair Lacquer. L. Schwartz—p. 1623.

Dermatitis from Hair Lacquer.—According to Schwartz, hair lacquers, which are used to keep stray locks in place, first were made of shellac either dissolved in alcohol or treated with borax or with triethanolamine. Dermatitis only rarely occurred

following the use of hair lacquer made from real shellac, but when the supply of shellac began to diminish on account of the war substitutes were used. Manila gum was the first substitute, but the supply of this also failed and cosmetic houses appealed to their shellac jobbers for a substitute. One jobber sold as a substitute for shellac a synthetic resin which had been used as a shellac substitute for wood varnish. The other chemical jobber when called on for a shellac substitute also furnished a synthetic resin. The composition of the resins was ascertained by questioning the two chemical concerns, each of which made one of them. This revealed that both resins, although obtained from widely different sources, were combinations of rosin and maleic anhydride. They differed only in that one manufacturer used in addition ethylene glycol, and that the other one, instead of actually using maleic anhydride to boil with the rosin, used fumaric acid, which is isomeric with maleic anhydride and changes rapidly to maleic anhydride on boiling. Undoubtedly the synthetic resins consisting of a combination of the maleic anhydride and rosin were the actual cause of the dermatitis, although the alkalinity of one of the products (pH 9) and the strong acidity of the other (pH 3) aided the penetration of the resin into the skin.

Quarterly J. Studies on Alcohol, New Haven, Conn.

4:163-352 (Sept.) 1943. Partial Index

- Glucose Tolerance of Alcohol Addicts: Study of 303 Cases. W. L. Voegtlin, P. O'Hollaren and Nello O'Hollaren—p. 163.
Rate of Disappearance of Alcohol from Blood in Obstructive Jaundice. G. Lolli and Miriam Rubin—p. 183.
First (1943) Summer Session of School of Alcohol Studies, Yale University. T. M. Jellinek—p. 187.
Functions of Alcohol in Primitive Societies: Cross Cultural Study. D. Horton—p. 199.

Southwestern Medicine, Phoenix, Ariz.

27:211-236 (Sept.) 1943

- Recent Advances in Ophthalmology of Interest to General Practitioner. P. H. Case—p. 213.
B. H. Vaccine in Allergy (A Preliminary Report). E. F. Boyd—p. 217.
Pyrospasm (Result of Brain Injury?). J. B. Walton—p. 222.

Union Médicale du Canada, Montreal

72:1243-1362 (Nov.) 1943

- *Indications for Anesthetic Infiltrations of Sympathetic Ganglions in Sequels of Traumatism. T. Bratek Kozlowski—p. 1245.
Experimental Studies on Surgical Treatment of Coronaritis. M. Fauteux—p. 1260.
Sterility. General Etiologic Factors. G. Hebert—p. 1263.
Problem of Sterility from Point of View of Urology. P. Bourgeois—p. 1267.
*Control of Osseous Metastases in Cancer of Breast. J. Bouchard—p. 1276.
Organization of Campaign Against Cancer in Province of Ontario. P. Brodeur—p. 1284.
Regional Heilts. A. Pettigrew—p. 1288.
Pointed Foreign Bodies in Digestive Tube. E. Dufresne—p. 1291.
Penetrating Wounds of Abdomen by Impalement of Perineum. P. A. Poliquin—p. 1294.
Epithelioma of Limbic Conjunctiva Cured by Radium. E. P. Gremer—p. 1298.

Anesthetic Infiltration of Sympathetic in Sequels of Traumas.—According to Bratek-Kozlowski, remarkable results have been obtained during this war in traumas of the extremities and nerves with anesthetic infiltrations of the sympathetic nerves. He reviews observations in 11 cases of injuries of the nerves and describes several interesting case histories. Explaining the technic of sympathetic infiltration, he first takes up that of the stellate ganglion, elucidating its anatomy on the basis of a diagram. He mentions numerous conditions for which infiltration of this ganglion has been employed and shows that nerve block by alcoholization is inadvisable. He uses from 10 to 15 cc. of a 1 per cent solution of procaine hydrochloride, as was recommended by Leriche and Fontaine. After evaluating the various approaches to the stellate ganglion he describes the lumbar sympathetic and the indications for and technic of the infiltration of this chain. He shows that infiltration of the sympathetic has a surprising effect in the sequels of injuries of

the extremities, particularly on the stiffness of the joints with edema, on the vasomotor or trophic disturbances and in certain painful sequels such as causalgia, cyanosis, sweating and the syndrome of Volkmann. It calms the pain instantaneously. Several minutes after the infiltration the voluntary mobility returns in the region of the paralyzed muscles; the arterial pressure increases and the oscillatory index increases. Sprain is in the majority of cases a vasomotor disorder of the nature of a reflex. From 10 to 15 per cent of cases are grave with important destruction. That is why the infiltration of the ligaments or of the lumbar sympathetic gives such excellent results.

Ossseous Metastases of Breast Cancer.—According to Bouchard, 180 cases of breast cancer have been treated at Royal Victoria Hospital since 1938. Of this number 37 showed roentgenologic signs of bone metastases, and death has occurred in 24 of these to date. These 24 cases are analyzed by the author. He found that 87.5 per cent of these metastases appeared in patients classed in groups 2 and 3 at the time the primary tumor was treated. The factor of age seemed to play no particular part either in the frequency or in the degree of the malignancy of these osseous metastases. The interval between the appearance of the primary tumor and the bony metastases was on the average three or four years, except in the patients between 20 and 30 years, in whom they seemed to appear in approximately half that time. The longer the interval, the longer is the survival. Osseous as well as pulmonary metastases must be systematically searched for, clinically as well as roentgenologically, before the patient is operated on. This search must be renewed in the course of the periodic examination, especially if the patient complains of so-called neuralgic or rheumatic pains. The search must be most thorough in the thorax, pelvis and lumbosacral part of the vertebral column. At least 75 per cent of the osseous lesions present an osteolytic aspect. An osteoblastic lesion indicates a slow growing metastasis. The prognosis must take into account other than skeletal metastases. Associated pleuropulmonary metastases make the prognosis much more unfavorable. Around 66 per cent of cases show subjective amelioration, while 26 per cent show objective improvement in response to palliative roentgen therapy. The patients with type 3 lesion should not be operated on; their primary and metastatic lesions should be irradiated. It is important to avoid forceful palpation of breast tumors and of their regional metastases, because such manipulations unfortunately are often the cause of dissemination of neoplastic cells.

War Medicine, Chicago

4:363-458 (Oct.) 1943

- Studies on Commercial Air Line Pilots. M. Clinton Jr. and G. W. Thorn.—p. 363.
Value of Electroencephalogram in Prognosis of Minor Head Injuries: Preliminary Report. H. I. Harris, C. L. Wittson and W. A. Hunt.—p. 374.
Nostalgia and Its Military Implications. D. J. Flicker and P. Weiss.—p. 380.
Military Aspects of Sunburn. H. F. Blum.—p. 388.
Treatment of Bacillary Dysentery Carriers. R. J. Hoagland, F. H. Harris and R. B. Raile.—p. 400.
Application of Electroencephalography in Navy in Wartime. R. S. Schwab.—p. 404.
Errors in Mass Blood Grouping and Methods of Minimizing Them. E. L. DeGowin.—p. 410.
Rupture of Jejunum: Parachute Injury. C. A. Tinsman and D. W. Barrow.—p. 415.
Protective Action of Sulfanilamide Against Hepatic Damage from Chloroform Inhalation. J. C. Forbes and E. I. Evans.—p. 418.
Hypertension in Young Negroes. L. L. Orenstein.—p. 422.
Pentothal Sodium: Survey of Its Field of Usefulness in Military Hospital. A. M. Betcher.—p. 425.

Treatment of Bacillary Dysentery Carriers.—According to Hoagland and his collaborators the prevalence of the bacillary dysentery carrier state has been underestimated because the culture mediums formerly used were relatively inefficient and dysentery bacilli are often only intermittently demonstrable in feces specimens. This has resulted in the discharge of convalescent carriers from hospitals. An accurate evaluation of the efficacy of a drug in curing the bacillary dysentery carrier state can be established only if the newer, more efficient culture mediums are used and if many feces cultures are obtained over

as long a period as possible. In their own studies of patients who had had bacillary dysentery and of their contacts the authors found 45 carriers (12 convalescent and 32 chronic carriers) of *Shigella paradysenteriae*. A history of diarrhea was obtainable from 39 patients. None of the men had symptoms when admitted. Sulfaguanidine was given to 30 carriers and succinylsulfathiazole to 15. The daily dose of 20 Gm., divided into four doses given between 8 a. m. and 8 p. m., was given for six days. Routinely during treatment two leukocyte counts and hemoglobin determinations, two urinalyses and one determination of the sulfonamide compound in the blood were performed. The level in the blood was determined after three or four days of treatment. Bacteriologic examinations of feces were performed before treatment was begun and were resumed four days after cessation of treatment. Both "SS" agar and desoxycholate-citrate agar (including 5 mg. of paraaminobenzoic acid in each hundred cubic centimeters) were used for feces cultures. Material for culture was obtained from feces or from rectal swabs. Dysentery bacilli disappeared from the feces of every patient. A total of 503 feces cultures were examined. No significant toxic reactions attended the use of either drug, but the patient receiving succinylsulfathiazole experienced minor annoyances. The criterion of cure was a minimum of nine consecutive negative reports of feces cultures made after cessation of treatment.

Electroencephalography in the Navy.—According to Schwab, electroencephalography has three applications: The first is in the examination of applicants for naval service. Since electroencephalography takes forty-five minutes and requires special equipment, it cannot be done on all applicants. Only those who give a history of fainting or of recent head injury are referred for such examination. Candidates who have vague neurologic complaints, who sleep walk, and the like, may be referred. A normal record makes it possible to accept an applicant in spite of a history of an occasional syncope, whereas definitely abnormal waves suggest the advisability of rejection. The second application is in men actually in the naval service who have fainted or who have "spells." It aids in building up an accurate diagnosis of epilepsy. The third use is that of helping to fix the extent of intracranial damage to personnel who have suffered head injuries. The electroencephalogram is useful in helping the physician to determine when these men can be sent back to duty. Ninety per cent of the naval personnel with clinical epilepsy had abnormal electroencephalograms. Subjects with isolated syncopes who were clinically not epileptic usually showed normal records. In cases of mild head injury a normal record was the rule, and in cases of severe injury an abnormal record persisted long after the clinical signs had cleared up. The usefulness of electroencephalography in the diagnosis of, or in the elimination of a suspicion of, an epileptic tendency seems to have been thoroughly proved. Nineteen of 20 patients who had chronic seasickness showed normal electroencephalographic records. This method of examination is in no way a short cut and does not eliminate the necessity of a careful history and neurologic study.

Yale Journal of Biology and Medicine, New Haven

16:1-104 (Oct.) 1943

- Enzymes as Factors in Resistance to Tuberculosis: II. Inhibition of Enzyme Activity by Fatty Acids. B. Gerstl and R. Tennant.—p. 1.
Types of Hemolytic Streptococci in New Haven. P. L. Boisvert and Loraine M. Kerr.—p. 9.
Embryology of Human Hip Joint. L. M. Strayer Jr.—p. 13.
Synovioma Involving Knee Joint: Case Report. M. S. Eveleth and P. S. Brezina.—p. 27.
Lens Induction in Salamander (*Amblystoma punctatum*) with Special Reference to Conditions in Experimentally Produced Cyclopia. L. S. Stone and F. L. Dinnean.—p. 31.
Effect of Estrogenic Hormones on Bacterial Content of Uterus. I. Weinstein, W. U. Gardner and E. Allen.—p. 43.
Development by Ducks of Natural Neutralizing Antibodies for Duck Variant of Rous Sarcoma Virus. J. W. King and F. Duran-Reynals.—p. 53.
Color Blindness in Eleven Thousand Museum Visitors. W. R. Miller.—p. 59.
Psychiatric Aspects of Child Bearing. L. H. Cohen.—p. 77.
Soap Lake: Spa for Thromboangiitis Obliterans. K. W. Thompson.—p. 93.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

2:473-502 (Oct. 16) 1943

- Peptic Ulcer and Dyspepsia in Army. H. Tidy.—p. 473.
Levels of Vitamin A and C Nutrition in Glossop School Children and Effect of Deficiencies on Their Physical Condition (preliminary communication). G. Kohn, E. H. M. Milligan and J. F. Wilkinson.—p. 477.
Age Incidence and Prognosis of Epilepsy. F. J. Nattrass.—p. 481.
Scope of Prevention in Ophthalmology. Ida Mann.—p. 482.
Rise in Potassium Concentration in Blood Stream Following Ischemia of Muscle Masses. R. E. Rewell.—p. 483.

2:503-534 (Oct. 23) 1943

- Studies in Vitamin B Deficiency, with Special Reference to Mental and Oral Manifestations. A. G. Clarke and F. Prescott.—p. 503.
Endemic Typhus Fever in Diego Suarez Madagascar. C. G. Baker, G. T. L. Archer and G. B. Mitchell-Heggs.—p. 506.
Two Cases of Anuria Due to Sulfapyridine Calculi Successfully Treated by Ureteric Catheterization. H. Burt-White and A. G. Johnson.—p. 508.
Immobilization and Transportation of Fractured Femur in War. R. W. Power.—p. 509.
*Local Chemotherapy in Chronic (Nonrheumatoid) Rheumatism. G. L. Scott.—p. 510.
Congenital Dilatation of Pulmonary Artery: Case. H. L. Heimann and M. M. Posel.—p. 512.

Local Chemotherapy in Rheumatism.—Scott thinks that previous workers have failed with local therapy for rheumatism because in fibrositis their dose was far too small but in the treatment of joints much too large. In the former 20 cc. rising to 50 or 60 cc. is usually well tolerated, whereas with joints 0.1 cc. to 0.2 cc. must not be exceeded. The author uses a 0 per cent solution of benzyl salicylate in oil. He observed at the rules of vaccine administration govern the weekly spacing, rising doses, negative phase and improving tolerance. The results obtained in a series of 96 consecutive and fully corroborated cases are assessed; 12 of these are briefly described. In 76 the results were good, in 14 fair and in 6 negative. The claim to innovation rests on matters of dosage and technic, the past neglect of which has obscured the value of local chemotherapy in chronic rheumatism.

Medical Journal of Australia, Sydney

2:181-200 (Sept. 4) 1943

- Low Back Pain. J. H. Young.—p. 181.
War Wounds in Libyan Desert. J. Devine.—p. 187.
*Sulfaguanidine Treatment of Shiga Dysentery in New Guinea. J. J. Gard.—p. 188.

Sulfaguanidine in Shiga Dysentery.—Gard describes the results of treatment in 25 cases of bacillary dysentery due to *Bacterium shigae* in New Guinea. Although many patients with dysentery were admitted to the hospital during the campaign, Shiga infections were not observed until the closing stages. Since this type of dysentery is common in Japan, it is possible that the enemy was the source of infection. The Shiga dysentery encountered was on the average more severe than infections caused by *Bacterium flexneri* or the Boyd variety. It is not, however, safe to predict the type of infecting organism from the symptoms. In the treatment an initial dose of 2 or 4 drachms (7.5 or 15 cc.) of sodium sulfate solution was given. This was followed in two hours by 7 Gm. (14 tablets) of sulfaguanidine; then 3.5 Gm. (7 tablets) was given every four hours. Five doses were given each day until the number of stools in twenty-four hours was five or less, when the dose was reduced to 3.5 Gm. three times a day until the number of stools was normal for two or three days. In severe cases with much dehydration and exhaustion the initial dose of saline solution was dispensed with and 7 Gm. of sulfaguanidine was given immediately; this dose was followed by 3.5 Gm. given every four hours. One fourth of a grain (0.016 Gm.) of morphine and 1 one-hundredth of a grain (0.00065 Gm.) of atropine were given in all cases associated with abdominal pain. Fluids were given in the form of water, cordials, fruit drinks and barley water (from 4 to 6 pints [demiliters] a day). The patients were not starved. The average period during which

sulfaguanidine was administered was 13.5 days. Specific Shiga antitoxic serum was not used, nor was it required. No toxic effects were observed which could be attributed to sulfaguanidine, in spite of the large doses employed.

Ophthalmologia Ibero Americana, Buenos Aires

5:1-94 (No. 1) 1943. Partial Index

- *Therapy of Optic Neuritis with Nicotinic Acid. S. Barrenechea, R. Contardo, J. Arentsen and A. Jasmén.—p. 7.

Therapy of Optic Neuritis with Nicotinic Acid.—Barrenechea and his collaborators employed nicotinic acid in 5 cases of optic neuritis. The disease was retrobulbar in 4 cases. It was of alcoholic origin in 2 cases, due to focal infection in 2 cases and secondary to mumps in 1 case. The drug was administered by mouth in doses of 50 mg. each six times a day up to a daily total dose of 300 mg. for ten consecutive days. In the course of the first twenty-four or forty-eight hours central vision and visual field improved, the central scotomas disappeared and the subjective symptoms stopped. The author believes that optic neuritis whether retrobulbar or not is due to local avitaminosis which results from the increased use of the vitamins, especially nicotinic acid, by the body owing either to local or general infection or to increased destruction of vitamins by bacterial toxins. Because of the fact that the good results of nicotinic acid therapy are not permanent for as long as focal infection remains, it is advisable to carry on the proper examinations of the patient in the course of nicotinic acid therapy in order to control properly the infection after administration of nicotinic acid.

Rev. Argent.-Norteam. de Cienc. Méd., Buenos Aires

1:285-412 (July) 1943. Partial Index

- Transthoracic Injection of Neoarsphenamine and Sulfonamides in Pulmonary Suppurations. M. R. Castex, E. L. Capdechourat and A. Martinez Marchetti.—p. 285.
Modern Treatment of Allergy. E. Urbach.—p. 293.
*Neurohepatic Degeneration. T. Fracassi.—p. 310.
Present Status of Endocrine Therapy in Gynecology. S. H. Geist and U. J. Salmon.—p. 321.
Treatment of Acute and Chronic Traumatic Temperomandibular Arthritis. L. W. Schultz and W. Shriner.—p. 350.
Mesenteric Cysts. P. L. Mirizzi, A. P. Cinelli and L. Ferraris.—p. 373.

Neurohepatic Degeneration.—Fracassi shows that, contrary to Wilson's and von Economo's belief, the degenerative process in hepatolenticular degeneration is not limited to the lenticular nuclei and the putamen but extends to the cerebral cortex, the white substance and the gray nuclei. He therefore thinks that neurohepatic degeneration would be a better term and includes under it not only Wilson's disease and the pseudosclerosis of Westphal and Strümpell but all cerebral degenerative nervous alterations caused by degenerative hepatic lesions. A case is described which could be considered Wilson's disease but which was really atrophic cirrhosis of Laënnec, probably due to a gastrointestinal disorder, since alcoholism or syphilis was absent. The patient showed neurologic manifestations ten years after the first symptoms of hepatic cirrhosis. The first neurologic manifestation was mild paralysis of the hands and legs. Later, speech became slow and hesitant and tremor of the hands developed. Clinical examination revealed an extrapyramidal syndrome with parkinsonian rigidity of the face and hand tremor, a moderate muscular rigidity, and dysarthria and tremor of the lips and tongue with difficulty in swallowing. There were also signs of a pyramidal syndrome: pronounced decrease in the strength of limbs, exaggerated tendinous reflexes, bilateral clonus of the foot and positive Babinski's sign in the left one. The patient also presented symptoms of cortical excitation in the form of epileptiform fits. He died of a pneumonia, and the necropsy showed atrophic cirrhosis of the liver with fibrous perihepatitis and interstitial splenitis as well as varices of the esophagus. There were atrophy of the cerebral cortex, laminar softening, atrophy of the striatum nuclei with softening and cystic dilatation of the perivascular spaces and areas of softening in the optic layer. Glial elements were abundant in the cortex and in the striatum nuclei. There were areas of circumscribed and diffuse denucleinization in the frontoparietal white substance.

Book Notices

The Principles and Practice of Industrial Medicine. Edited by Fred J. Wampler, M.D., Professor, Preventive and Industrial Medicine, Medical College of Virginia, Richmond. Cloth. Price, \$6. Pp. 579, with illustrations. Baltimore: William Wood & Company, 1943.

The impressive collection of thirty-three contributed chapters by authorities in the field of industrial health is in effect a genuine testimonial to the expanding scope and importance of the subject. Indeed, the statement is made that industrial medicine is as broad as medical practice and that no one individual can fully comprehend, let alone supply, the entire demands which industry as a whole places on medicine and hygiene. This book does supply the answers to many gaps in professional knowledge—gaps which the editor very pointedly attributes to failure of medical educators to recognize a most significant and valuable element in the distribution of highly necessary medical service. Excellent information is presented on these subjects, which all too often fall outside the customary range of medical interest and experience but about which physicians must be prepared to answer—accident occurrence and prevention, environmental medicine, illumination, fatigue, toxicology, workmen's compensation and rehabilitation. All of these important elements to a real understanding of industrial medicine are included, and the professional standing of the contributors is excellent evidence of dependable treatment. There are in addition chapters of major medical and surgical interest which will be equally revealing to nonprofessional readers.

A Study of Absenteeism Among Women. By S. Wyatt, R. Marriott and D. E. R. Hughes. Medical Research Council, Industrial Health Research Board. Emergency Report No. 4. Paper. Price, 2d. Pp. 12. London: His Majesty's Stationery Office, 1943.

This is a report of a limited study of absenteeism among women carried out on random samples of the personnel, over a six week period, at two royal ordnance factories. It was concerned with the amount and distribution of absenteeism rather than with its causes.

The following conclusions were reached:

1. Very few women were in the habit of losing one or two shifts a week.
2. Married women lost more time than single women.
3. The larger proportion of absences were from single shifts (68.3 per cent and 60.3 per cent in factory A and B respectively) but these accounted for only 34.9 per cent and 24.8 per cent of the total number of shifts lost.
4. Absenteeism was higher on the day shift than on the evening and night shifts.
5. Younger women (up to 25 years of age) lost more time than older women.

Principles of Behavior: An Introduction to Behavior Theory. By Clark L. Hull, Professor of Psychology, Institute of Human Relations, Yale University, New Haven. Cloth. Price, \$4. Pp. 422, with 84 illustrations. New York & London: D. Appleton-Century Company, Inc., 1943.

In this book the author attempts to integrate and systematize his previous work on the mathematical analysis of behavior. After an able introduction on the heuristic validity of "symbolic constructs" the author proceeds to assign specific symbols to various conative and integrative factors in behavior, such as (S) for "environmental energies," (s_U) for "unlearned receptor-effector-connections" and (s_H) for "habit." These and many other symbols are then combined into equations derived mainly from animal experimental data. In essence the formulas are designed to cover the consequences of the basic postulates that the behavior of an organism with a given neural organization depends "(1) upon the state of disequilibrium or need of the organism and (2) upon the characteristics of the environment, external and internal." Motivation is thus not neglected, but it is attributed to "hormone-like substances" and equated with various combinations of "potentiality of response evocation (s_{E_n})," "drive stimuli (S_n)" and other such constructs. As may be seen, the author's approach, thinking and style are uncompromisingly abstract and symbolic, so that the book makes most difficult reading, even with frequent cross references to

the glossary and index. However, Dr. Hull is to be commended for a courageous and searching attempt to express behavior in physiomathematical terms, and as such his work will be welcome to psychologists and biomathematicians with similar interests. Unfortunately, such pioneer work cannot yet be immediately useful to the clinician, who will probably have to wait many a generation for mathematical formulas significant for even the simplest impulses and idiosyncrasies of his friends or patients.

Health Instruction Yearbook 1943. Compiled by Oliver E. Byrd, Ed.D., Associate Professor of Hygiene and Director, Division of Health Education, School of Health, Stanford University. Foreword by Ray Lyman Wilbur, M.D., Chancellor, Stanford University. Cloth. Price, \$3. Pp. 308. Stanford University, Calif.: Stanford University Press; London: Oxford University Press, 1943.

The book has twenty chapters dealing with health as a social accomplishment, health as a social problem, nutrition and health, excretion and health, exercise and body mechanics, fatigue and rest, mental health and disease, heredity and eugenics, infection and immunity, chronic and degenerative disorders, habit forming substances, the care of special organs, safety, health and physical environment, health services and facilities, family health, school health, occupational health, community health services and trends and probabilities. There is a bibliography and an author index and a subject index.

In each chapter are varying numbers of excerpts of different length from publications of many agencies and by numerous authors. A typical section is that of chapter I, which deals with health as a social accomplishment. In this chapter are excerpts on improved health conditions in the decade 1930-1940, death records for 1942, health in 1942, health of the Navy, length of life, "We Outlive Our Expectation of Life," length of life almost doubled in six decades, infrequent deaths for some diseases in 1941, the American Army is healthy, medical progress in the American Army and "People Grow Taller in America."

One might find considerable cause for differing with the editor in his selection of material to publicize. In his chapter on health as a social problem, chapter II, he gives figures on Army rejections on physical and related grounds but does not choose to publicize related material, such as that published in the Statistical Bulletin of the Metropolitan Life Insurance Company, indicating that these rejections have little relationship to the health of the nation, being technical rather than clinical.

The items are numbered from the beginning of the book straight through in one sequence, so that the first item in chapter IV is number 49, and so on. In order to ascertain the full bibliographic information on each item it is necessary to turn to the bibliography. It might have been more convenient if the identification had been placed in direct relationship to the article. With both a subject and an author index this would have made for much easier reference.

This is an interesting beginning and can be a very useful venture. Yearbooks on public health have been tried before and have unfortunately found but a small sale, perhaps because most physicians are clinically minded. The recent upsurge of interest in public health and in health education may make this a more propitious time for a book of this kind. Naturally such a book represents the selections of one editor, possibly with advice from others. His selections also represent but a small fraction of the literature appearing each year. It should be a handy reminder and refresher volume, but it cannot be anything more. By itself it must necessarily give but a sketchy idea of what has happened during the year. A question arises as to the dating of this handbook. It is entitled "Health Instruction Handbook 1943." Obviously it cannot cover 1943, since it was received for review in October and therefore must have been compiled and prepared early in 1943. Most of the bibliographic dates are in 1942, and at least some of the material refers to editions in 1941. It would seem that this dating is at least somewhat misleading.

As an introductory volume this is interesting and useful. Undoubtedly experience and criticism will enable the editor to produce better material as the years go on.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

USE OF ERGONOVINE IN LABOR

To the Editor:—In a small hospital where expert consultation is not always close at hand is it safe to give ergonovine intravenously immediately after the delivery of the head? Also is it safe to give it either intravenously or intramuscularly at any time before the placenta is delivered?

Walter G. Bernard, M.D., Detroit.

ANSWER.—Ergonovine can be administered safely at the end of the second stage of labor if facilities for its use are available. The experience of the last three years in over ten thousand deliveries has indicated that the intravenous use of ergonovine to hasten the third stage of labor has reduced the incidence of complications in this period. The loss of blood has been greatly diminished, and the incidence of postpartum hemorrhage has decreased tremendously.

The hazard of using the drug at the end of the second stage of labor is the failure of expulsion of the separated placenta into the lower uterine segment and vagina and its possible incarceration in the lower contractile portion of the uterus, so that manual removal of the placenta becomes necessary. Proper timing in the intravenous use of ergonovine will reduce this hazard greatly. For its optimum effect the drug should be given as the anterior shoulder stems under the arch of the pubis, following which there should be a delay of about thirty seconds and the posterior shoulder delivered. The separation of the placenta occurs almost instantaneously as the uterus contracts down following the expulsion of the baby. The oxytocic effect produces a powerful uterine contraction, which results in the separation of the placenta and its extrusion into the lower uterine segment and vagina. It should be expressed from this locality promptly.

When ergonovine is given intramuscularly after delivery of the baby, about six or seven minutes is required for it to exhibit its action. By this time the placenta has separated spontaneously. The oxytocic effect is valuable in the expulsion of the separated placenta and in maintaining the uterus in good tone. There are no serious objections to the intramuscular administration of this drug after the delivery of the baby, although occasionally the incarceration of a placenta in the uterus does occur.

Reference:

Davis, M. Edward, and Boynton, Melbourne, W.: The Use of Ergonovine in the Placental Stage of Labor, *Am. J. Obst. & Gynec.* 43: 775 (May) 1942.

ONYCHOLYSIS

To the Editor:—A woman aged 42, who had always been in good health, about eighteen months ago began to have a looseness of the fingernails. There is no pain unless the loose ends are caught. The condition has been progressive, so that almost all the fingernails are loose with the exception of three. This does not affect her toenails. She has in the past been making soap and wonders if by any chance the lye could have been the cause of it. I have been unable to find anything in the textbooks or in the literature on this condition and wondered if you could give me the cause and suggest a treatment.

E. R. Sather, M.D., Alexandria, Minn.

ANSWER.—Since Oppenheim in 1909 (recounted by H. J. Templeton, Onycholysis, *THE JOURNAL*, Dec. 26, 1931, p. 1950) presented several cases of onycholysis in women doing laundry work, knowledge of the incidence of this nail dystrophy among industrial workers has grown. Schwartz and Tulipan (*Occupational Diseases of the Skin*, Philadelphia, Lea & Febiger, 1939, p. 541) list bartenders, bottle washers, cigar makers, confectioners, farm laborers, fruit workers, gardeners, milkers, vegetable cleaners and washerwomen as prone to this disorder. Soap makers are not listed; but the number of women who make their own soap is small and it seems possible that this job could precipitate an attack of onycholysis in a predisposed person. Templeton, in his report of a series of cases in bottle washers, shows that a definite predisposition exists, so that in two days of this employment the susceptible persons could be picked out. Others continued the work for long periods without such trouble.

In the case cited in the query, trauma of another kind or some constitutional factor must be suspected to have continued the trouble. Endocrine disturbances are the commonest predisposing factor, hypothyroidism and hyperthyroidism causing

many cases (Fox, E. C.: Diseases of the Nails, *Arch. Dermat. & Syph.* 41:98 [Jan.] 1940) with other endocrine disturbances seldom at fault. Fox calls attention to the intimate relation of vitamin deficiencies to endocrine disturbances, and in the discussion of this paper Becker emphasizes the effect of nervous disease, particularly neurodermatitis. Years ago Dubreuilh reported cases due to neurosis.

Even though the patient under discussion has no discernible sign of endocrine dysplasia, it may be justifiable to try a cautious course of thyroid extract. Heller (*Onycholysis*, *Handb. d. Haut- u. Geschlechtskr.* 13:113, 1927) suggests binding the loose nails with strong applications of tar, ichthammol or salicylic acid. Many patients with onycholysis have recovered after a course of roentgen treatments. If other means fail, this is justifiable. One may give weekly doses of 75 to 87 roentgens of unfiltered or lightly filtered rays, avoiding all irritating local applications during the period of treatment and for three weeks after the end of the course.

DURATION OF PROTECTION FROM ANTIRABIC VACCINATION

To the Editor:—If the information is available will you please tell me how long patients are protected who have been treated with antirabic vaccine? A number of patients here have been bitten by rabid dogs, have received Pasteur treatment and are wondering what protection they would have if bitten again in the near future. Carlyle Smail, M.D., Jerome, Idaho.

ANSWER.—How long antirabic vaccination protects against rabies is not known. There is lack of information on that point. From what is known about the specific protections produced by other forms of vaccination it lies near at hand to assume that the protection produced by antirabic vaccination may persist for months at least, but on account of the variability in the factors concerned there may be great variation in the effective persistence of protection. Accordingly it will be safest to advise revaccination if the patient is bitten again after even a short time. The second bite may be much more dangerous than the first.

EDEMA OF ANKLES ASSOCIATED WITH MENSTRUATION

To the Editor:—An unmarried woman with menstrual periods of three days occurring every twenty-eight days has been having considerable lower leg and ankle edema associated with her menstrual periods for the past sixteen months. There is no associated dysmenorrhea. Physical examination is essentially negative. There has been no response to eliminating the sodium radical from her diet the latter half of her menstrual cycle or from ammonium chloride or from either small doses of estrogenic substance or moderate doses of corpus luteum preceding her menstrual periods.

Robert S. Millen, M.D., New York.

ANSWER.—Salt and water retention may occur during the five days preceding menstruation, and with the onset of menstruation a diuresis may ensue. Such premenstrual edema usually responds well to a diet of low salt content and potassium citrate 10 cc. of a 20 per cent solution in fruit juice two or three times daily (total of 30 cc. daily) administered for five to six days prior to the onset of menstruation. Treatment with estrogenic substance or corpus luteum is of little value under such circumstances.

When edema is limited to the lower part of both legs as it is in the patient mentioned and when it has come on recently, one must also consider other causes which would aggravate the inherent tendency to retain salt and water at this time. The possibility of poor venous return, incompetent valves of the veins or venous obstruction deserves serious consideration, and appropriate tests for competent venous circulation should be made. It might also be helpful to measure the venous pressure in the lower extremities and compare this with the venous pressure in the arms. In most patients presenting the onset of swelling of both legs one ultimately finds either incompetent venous circulation, obstruction in the inferior vena cava or portal circulation, a mass in the pelvis, or local obstruction to circulation.

SNAKE VENOMS FOR RHEUMATISM

To the Editor:—What is your opinion of the use of moccasin venom for arthritis? Cyril E. Bousfield, M.D., Woolwich, Maine.

ANSWER.—Venom from several species of snakes, including the cobra, pit viper, water moccasin and copperhead, have been employed by various workers in the treatment of arthritis and other rheumatic disorders. Their virtues have not been impressive to physicians, although laymen have long favored ointments of snake oil and the stings of bees in the treatment of "rheumatism." The consensus among qualified workers today is that the scientific evidence for any of these venoms in the treatment of rheumatism is lacking. None of the snake venoms have any established place in the treatment of arthritis or rheumatism.

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MANAGEMENT OF THE VENEREAL DISEASES IN THE ARMY

LIEUTENANT COLONEL THOMAS B. TURNER
AND
MAJOR THOMAS H. STERNBERG
MEDICAL CORPS, ARMY OF THE UNITED STATES

During recent months the rate of venereal infection in the Army has been below preceding peacetime levels and less than half that recorded during the first world war. Days lost per thousand men annually have dropped from 1,278 in 1940 to a level of approximately 400 at the present time. Nevertheless venereal disease patients accounted for approximately 2,824,000 hospital bed-days during the twenty month period from January 1942 to September 1943.

Determined efforts have therefore been made to reduce this manpower loss through measures aimed at the prevention of infection and through the more efficient treatment of the individual after infection. Since no sharp line can be drawn between prevention and treatment, responsibility for the formulation of policies and plans covering the entire venereal disease problem has been centralized in one branch of the Surgeon General's Office. The preventive program has been outlined elsewhere.¹ Briefly, reliance is placed on instruction of the individual soldier, on prophylaxis and, in cooperation with civilian agencies, on furthering those measures designed to reduce the potential sources of infection in the community. Gratifying results have been achieved in preventing venereal disease, as evidenced by the maintenance of a low infection rate, and new discoveries and changing administrative procedures have virtually revolutionized the treatment of these diseases.

In reviewing the treatment aspect of this program it should be pointed out that the Surgeon General's Office in initiating changes and promulgating new policies has had the benefit of the advice of the most eminent civilian specialists in the country, as well as those now in the armed services. Particular acknowledgment should be made of the valuable help received from members of the National Research Council.²

Read at the fifteenth annual scientific assembly of the Medical Society of the District of Columbia, Oct. 1, 1943.

From the Venereal Disease Control Branch, Preventive Medicine Division, Office of the Surgeon General, U. S. Army.

1. Turner, T. B., and Brumfield, W. A., Jr.: The Control of Venereal Disease in the Army, Am. J. Syph., Gonorr. & Ven. Dis., to be published.
Turner, T. B.: Immediate Wartime Outlook and Indicated Postwar Conditions with Respect to the Control of the Venereal Diseases, Am. J. Pub. Health 33: 1309 (Nov.) 1943.

2. The Venereal Disease Subcommittee of the National Research Council comprises the following members: Drs. Joseph Earle Moore, chairman, John H. Stokes, Oscar F. Cox, Jr., Charles Walter Clarke, Neil Nelson, John F. Mahoney and Russell D. Herrold.

SYPHILIS

The treatment of syphilis presents a real problem to the modern army. Both the training program and actual campaigns are so arduous that soldiers who are physically under par fall short of requirements and serve as a drag on the group to which they are attached. Although symptoms caused by early syphilis can be quickly eliminated, treatment itself may result in morbidity, while continuation of treatment over long periods presents numerous administrative difficulties. Military requirements are best served by a system of treatment covering the shortest possible time consistent with safety to the patient and therapeutic efficiency.

Routine Treatment.—In July 1942, on recommendation of the venereal disease subcommittee of the National Research Council, the scheme of treatment of early and latent syphilis was substantially altered in two respects. First, arsenoxide (mapharsen) was recommended to the exclusion of the other arsenicals, and, second, the scheme of treatment was changed from alternating courses of an arsenical and a bismuth preparation given in weekly injections covering a period of one to two years to an intensified and shortened treatment scheme consisting of forty injections of arsenoxide administered twice weekly with additional injections of bismuth, covering a total of twenty-six weeks. The actual treatment scheme is given in the accompanying tabulation. The recommended individual dose of arsenoxide is 60 mg. and of bismuth subsalicylate 0.2 Gm. in oil.

This treatment scheme has been in effect only a little over a year, and no accurate data are available on the results in terms of the percentage of patients cured. Since this system is merely a modification of older ones and the total amount of arsenoxide administered (2,400 mg.) is about the same, it is assumed that the end results will not differ significantly, and that cures will be effected in not less than 85 per cent of cases of early syphilis.

The short term results have been excellent. From the standpoint of toxic reactions and practicability of administration, the newer scheme appears to be definitely superior to the older one. Persons with primary or secondary syphilis are hospitalized for a few days until open lesions have healed. Treatment is then carried on by unit medical officers.

Intensive Arsenotherapy.—Intensive methods of arsenotherapy, such as the five day intravenous drip proposed by Hyman, Chargin and Leifer,³ and the

3. Hyman, H. T.; Chargin, L., and Leifer, W.: Massive Dose Arsenotherapy of Syphilis by Intravenous Drip Method: Five Year Observations. Am. J. M. Sc. 197: 480 (April) 1939.

modifications employed by Schoch and Alexander⁴ and Thomas and Wexler⁵ would appear to offer many advantages to the armed services. The available evidence indicates that the results achieved by these methods in early syphilis are equal to those obtained by the routine treatment just described, but no intensive method has been adopted by the Army for routine use because of the enhanced risk of serious reaction and death that is inherent in these methods. In all the large series which have thus far been reported⁶ death has occurred in the proportion of 1 to approximately 250 patients treated, a mortality rate from treatment alone which must be compared with not more than 1 death in 5,000 when arsenoxide is given by routine methods.

The one day method of Simpson, Kendell and Rose,⁷ in which arsenoxide and fever therapy are combined, has the further disadvantage of being technically more difficult and no less risky than the five day intravenous

ment, and studies by numerous investigators both in the clinic and in the laboratory are rapidly determining those time-dose relationships which will yield a high proportion of cures in a short period of time with relative safety to the patient.

Mahoney and his co-workers⁹ have recently reported on the apparent effectiveness of penicillin in early syphilis. The import of this observation is stupendous and cannot be evaluated at this writing.

Biologic False Positive Serologic Tests.—Another point of importance which has been emphasized by Army experience concerns the frequency of biologic false positive serologic tests for syphilis. It has long been known that certain febrile diseases, such as malaria and respiratory infections, give rise to an increase in “syphilitic” reagin in the blood, sufficient in some instances to cause a frankly positive serologic test.

The Army is in a unique position to obtain further data on this perplexing problem. For the first time in history we now have a vast number of individuals under close observation, whose serologic status was determined prior to entering the Army, who since induction have been subjected to frequent inspections for the detection of venereal disease, and whose serologic status has been observed during the course of and subsequent to vaccination procedures and various acute illnesses.

The results of some of these observations have been presented by Arthur and Hale,¹⁰ Loveman¹¹ and Rosenberg.¹²

In brief, it is clear that the ordinary precipitation and complement fixation tests become positive in a high proportion—certainly not less than 15 per cent—of individuals following vaccination for smallpox with take and during the course of a great variety of acute febrile diseases. The “syphilitic” reagin commonly reaches its highest point within one to three weeks and then gradually declines, so that the serum will usually give a negative test within six weeks. Medical officers have therefore been cautioned that positive or doubtful serologic reactions occurring in individuals following vaccination procedures, or in those who have recently had acute infections, should not be considered indicative of syphilis. It is recommended that such individuals who have no conclusive history or clinical manifestations of syphilis be followed serologically and without treatment for a period of three months, serologic tests being performed each two to four weeks. At the end of this period those in whom the serologic reaction has reversed to negative are discharged from observation as nonsyphilitic; those showing a persistently positive test are regarded as syphilitic, and those still showing conflicting serologic reactions are subjected to further observation and study.

GONORRHEA

As a medical problem gonorrhea is totally different from that which it was five years ago. Approximately 70 per cent of persons with uncomplicated gonorrhea

Treatment Scheme			
		Week	
Arsenoxide (mapharsen) intravenously twice weekly, total 20 injections		1	Bismuth subsalicylate intramuscularly once weekly, 5 doses
		2	
		3	
		4	
		5	
		6	Omit bismuth for 5 weeks
		7	
		8	
		9	
		10	
Omit arsenoxide (mapharsen) for 6 weeks		11	Bismuth subsalicylate intramuscularly once weekly, 6 doses
		12	
		13	
		14	
		15	
		16	Omit bismuth for 5 weeks
		17	
		18	
		19	
		20	
Arsenoxide (mapharsen) as in first course, twice weekly, total 20 injections		21	Bismuth subsalicylate intramuscularly once weekly, 5 doses
		22	
		23	
		24	
		25	
		26	

drip. The system proposed by Eagle and Hogan,⁸ in which arsenoxide is given triweekly for a period of eight to twelve weeks, likewise appears to offer no advantages over more prolonged schemes; for while the mortality rate seems to be lower than with more intensive methods, milder reactions are sufficiently common to interfere seriously with the soldier's activities during the treatment period.

The importance of the contribution of Hyman and his co-workers in demonstrating the practicability of the five day treatment, if one is prepared to accept the risk, must not be minimized. This concept has already led to intensification of so-called routine treat-

4. Schoch, A. G., and Alexander, L. J.: Short Term Intensive Arsenotherapy of Early Syphilis: Preliminary Report, *Am. J. Syph., Gonorr. & Ven. Dis.* 25: 607 (Sept.) 1941.
5. Thomas, E. W., and Wexler, Gertrude: Rapid Treatment of Early Syphilis with Multiple Injections of Mapharsen, *Am. J. Pub. Health* 31: 545 (June) 1941.
6. Moore, J. E.: *The Modern Treatment of Syphilis*, ed. 2, Springfield, Ill., Charles C Thomas, Publisher, 1943.
7. Simpson, W. M.; Kendell, H. W., and Rose, D. L.: Treatment of Syphilis with Artificial Fever Combined with Chemotherapy: Results of Ten Years of Experience; Critical Review, *Ven. Dis. Inform.*, 1942, supp. 16, p. 1.
8. Eagle, H., and Hogan, R. B.: An Experimental Evaluation of the Intensive Methods for the Treatment of Syphilis: III. Clinical Implications, *Ven. Dis. Inform.* 24: 159 (June) 1943.

9. Mahoney, John F.; Arnold, R. C., and Harris, A. D.: Penicillin Treatment in Early Syphilis, to be published.
10. Arthur, Robert D., and Hale, John M.: Biologic False Positive Tests for Syphilis Associated with Routine Army Immunizations, *Mil. Surgeon* 92: 53 (Jan.) 1943.
11. Loveman, A. B.: False Positive Serologic Reactions for Syphilis: Report of 100 Cases Following Routine Army Immunization and Upper Respiratory Infections, to be published.
12. Rosenberg, Arthur A.: The Effect of Malaria on the Common Serological Tests for Syphilis, to be published.

respond within five to seven days to one course of sulfathiazole or sulfadiazine, another 10 to 15 per cent respond to a second course, and virtually all of the remainder can be cured within forty-eight hours with penicillin when that precious drug becomes more readily available.

The following data for the Army show the revolutionary changes that have taken place. During the years 1934 to 1937 inclusive persons with gonorrhea were hospitalized on an average of more than fifty days each. The average days of hospitalization declined to forty-five days in 1939, thirty-five in 1940 and twenty-two in 1941. Provisional data indicate that the average number of days lost per case is now under fifteen, and this figure can certainly be further reduced by the use of penicillin.

During the same period the frequency of complications has shown a striking decline. In 1937, 28 per cent of persons with gonorrhea developed some disabling complication. This proportion dropped to 12 per cent in 1939, 8 per cent in 1940 and 6.6 per cent in 1941. Current data indicate that less than 2 per cent of infected patients now develop complications. Facts of great significance are that with the increased use of sulfonamides in the treatment of gonorrhea the employment of local treatment for this condition has steadily decreased. The relationship of these changes in the management of gonorrhea to the duration of the disease and the development of complications is apparent.

Drugs Employed.—In the beginning of the sulfonamide era sulfanilamide was used in the treatment of gonorrhea. This was superseded by sulfapyridine and sulfathiazole. The latter drug, even in smaller doses than is now recommended, proved to be distinctly more effective and less toxic than sulfapyridine. Because of the factors of supply and cost, sulfathiazole is now employed routinely in the treatment of gonorrhea, although the use of sulfadiazine is also approved. There is no convincing evidence that for this purpose one is superior to the other.

Treatment is routinized as far as possible. For patients treated on a duty status and not hospitalized the recommended course of treatment is 4 Gm. of sulfathiazole a day for five days, given in doses of 1 Gm. four times daily. For hospitalized patients a higher dosage is recommended, as follows: 4 Gm. initially, followed by 1 Gm. every four hours day and night for five days, or a total of approximately 33 Gm.

Results of Treatment.—Data for the Army as a whole on the results of treatment of gonorrhea since the introduction of sulfathiazole are not yet available, but fragmentary reports from many stations and more complete data from a few of the larger stations permit certain generalizations. First, over three fourths of all patients with uncomplicated gonorrhea respond to one or two courses of a sulfonamide drug. Second, Negro patients respond more favorably than white. Third, the incidence of complications is exceedingly low. Fourth, toxic reactions from sulfathiazole present no serious problem, for even moderately severe reactions are uncommon and serious reactions are exceedingly rare. Fifth, when patients are treated on an ambulatory basis the end results in terms of propor-

tion cured, complications and drug reactions appear to be nearly as favorable as when treatment is given in a hospital.

The following data, accumulated over a period of months, give point to the foregoing statements: In a recent analysis of 2,100 cases of acute gonorrhea treated in one large station hospital¹³ of 804 white patients 81.5 per cent responded to two courses of sulfathiazole (20 Gm. each), while of 1,296 Negro patients 96.6 per cent recovered on the same treatment scheme. The proportion responding to the first course of sulfathiazole was white 65.2 per cent and Negro 91.8 per cent. A majority of the patients in this series were observed for three weeks or longer after the initiation of treatment. Epididymitis was observed in 1.1 per cent of cases and arthritis in 0.1 per cent. The incidence of each complication was slightly, though not statistically significant, higher in white than in Negro patients. Reactions from sulfathiazole, such as vomiting, elevated temperature, hematuria or dermatitis, were encountered in 1.1 per cent of this series.

From the same station¹³ an analysis of the results of treatment given on an ambulatory basis to 1,170 patients shows the following: Of 192 white patients 81.2 per cent were asymptomatic after two courses of sulfathiazole, and of 978 Negro patients 95.4 per cent were asymptomatic after the same treatment. Epididymitis was observed in 0.2 per cent. Drug reactions occurred in 0.4 per cent. These data are not strictly comparable to those cited for the hospitalized patients, since the patients treated on an ambulatory basis were largely drawn from the reception center where individuals are on temporary duty prior to proceeding to a permanent assignment, and follow-up observation was therefore not as complete.

In a series of 1,694 patients treated in another large station hospital¹⁴ by a dosage schedule approximating the larger (33 Gm.) of the two referred to, 82.4 per cent of the patients responded to the first course and another 10 per cent to a second course of sulfathiazole, giving a successful outcome in a total of 92.4 per cent with two courses. Epididymitis was observed in 0.5 per cent and arthritis in 0.3 per cent. Considerably more than half the patients in this series were Negroes.

In another large station hospital,¹⁵ of 770 patients with gonorrhea treated with the higher dosage schedule 85.4 per cent responded to the first course and 6.7 per cent to a second course, or a total of 92.1 per cent. Approximately 80 per cent of this series of patients were Negroes.

Of 1,117 patients treated for gonorrhea on a duty status at a number of stations of the Army Air Forces 75.7 per cent responded to two courses or less.¹⁶ Most of these patients were white.

It has been suggested by a number of observers that the proportion of sulfonamide failures is increasing, perhaps because of an increase in drug resistant strains of *Neisseria gonorrhoeae*. We have been unable to obtain evidence to support this suggestion.

13. From data collected by Major G. Campbell, M. C., and Capt. G. R. Carpenter, M. C., Fort Bragg, North Carolina.

14. From data collected by Major H. H. Curd, M. C., Fort George G. Meade, Maryland.

15. From data collected by Major E. Greenwald, M. C., Fort Belvoir, Virginia.

16. From data supplied by Major R. Dyar, M. C., and Major J. R. Scholtz, M. C., Office of the Air Surgeon.

Duty Status Treatment.—For many years soldiers with gonorrhea have been routinely hospitalized for treatment. Following a demonstration initiated and carried out under the supervision of Col. Sanford W. French, chief surgeon of the Fourth Service Command, the treatment of uncomplicated gonorrhea on a duty status was authorized for the Army as a whole in the early part of 1943. Present recommendations concerning duty status treatment call for one course of sulfathiazole to be given while the patient is carrying on his normal activities. If symptoms have not subsided within seven days after the beginning of treatment the patient is hospitalized and given a second course of sulfathiazole according to the higher dosage schedule mentioned.

While treatment of uncomplicated gonorrhea on a duty status is now widely practiced in the Army, there is still considerable discussion concerning whether in the long run hospital days are actually saved by this system. It is contended by some medical officers who have given thought to the problem that prompt hospitalization with the use of the higher dosage schedule will yield a lower proportion of sulfonamide failures. Data adequate to permit a conclusive answer on this point are not yet available. It is our opinion, however, that treatment of uncomplicated gonorrhea on an ambulatory basis is wholly practicable under most circumstances, and that the results are significantly inferior to those obtained by hospital treatment only when adequate care is not or cannot be taken to insure that the infected soldier receives his medicine at the proper time and in the proper dosage. There is no evidence indicating that ambulatory treatment is accompanied by an increase in the incidence of complications.

Despite theoretical arguments frequently advanced concerning the danger of patients with gonorrhea to their barrack mates, we have yet to learn of a case of gonorrhea acquired from toilet seats, towels or by means other than sexual contact. Gonococcic ophthalmia, even among persons with gonorrhea, has been encountered extremely rarely. In order to protect the civilian community, patients with gonorrhea are restricted to the organizational area for three weeks after the disappearance of urethral discharge.

Sulfonamide Failures.—It is estimated that fully 50 per cent of the total days lost from duty because of gonorrhea are accounted for by the 10 to 20 per cent of those patients who fail to respond to two courses of sulfathiazole or sulfadiazine and are classed as sulfonamide resistant. These patients were exceedingly difficult to cure by means formerly available. Some seem to respond to continuing doses of sulfonamides, others appear to be benefited by local instillations of a silver salt, while some become asymptomatic after many weeks with little or no treatment. Until the advent of penicillin, fever therapy—eight hours of continuous fever at a temperature of 106 F.—combined with sulfonamides by mouth was the only method by which resistant patients could be promptly cured.

In order to reduce the manpower loss occasioned by these resistant patients, facilities for fever therapy are provided in general hospitals. However, this method of treatment is expensive in terms of personnel and equipment; it is not without risk to the patient and

can be justified only on the basis of military necessity. It is hoped that enough penicillin will soon be available to treat all of these patients and render it unnecessary to use fever therapy.

Penicillin.—This remarkable drug bids fair to reduce gonorrhea to the status of an inconsequential infection. On receipt of reports from Mahoney prior to publication of the observations made by him and his co-workers¹⁷ the Army initiated in May 1943 clinical studies in a number of hospitals with a view to determining the smallest dose of penicillin which appears to yield a high proportion of cures.

Groups of patients proved to be refractory to at least two courses of sulfathiazole or sulfadiazine and in some cases to fever therapy were treated with a total dosage of 160,000, 120,000, 100,000, 80,000 and 40,000 Oxford units, respectively. Approximately half of each group was given 10,000 units every three hours, and the other half 20,000 units at the same interval. Most treatments were given intramuscularly, and this route was shown to be superior to intravenous administration.

The results of these clinical studies will be reported in detail elsewhere. To summarize them briefly, better than 95 per cent of each group receiving a total dosage of 80,000 units or above were cured as determined by culture of the prostatic secretion at the end of seven, fourteen and twenty-one days after the initiation of treatment. Even with 40,000 units there were less than 15 per cent failures.

In those patients who responded, cure was effected with extraordinary rapidity, subjective and objective improvement occurring in most cases within twenty-four hours after the beginning of treatment. Cultures were often negative in twenty-four hours and almost invariably so in forty-eight hours. In a fair proportion of treated patients a very slight mucoid discharge persisted for one or two weeks, but no organisms were demonstrable on smear or culture and the slight discharge is regarded as being of no significance. Failures on any of the dosage schedules employed were usually evident by the end of the first week. Some penicillin resistant patients simply failed to show any improvement, while others improved symptomatically and then relapsed. Relapses were rarely observed after ten days. Persistent infections in the absence of symptoms were only rarely observed, and these occurred principally with the lower doses. Nearly all of a number of patients who failed to respond to the first course of penicillin were cured by retreatment with 10,000 units of penicillin every hour for ten doses.

In view of the limited supply of penicillin, use of the drug is being largely restricted to theaters of operation where an effort must be made to keep every soldier on the job. While a total dosage of 80,000 to 100,000 units per case gives better results, a course of treatment consisting of 10,000 units intramuscularly every three hours for five doses, or a total of 50,000 units, is recommended, with recognition that 10 to 20 per cent failures may be expected at this dosage level. Failures with the first course are retreated with penicillin, a total dosage of 100,000 units per case being used.

17. Mahoney, J. F.; Ferguson, Charles; Buckholtz, M., and Van Slyke, C. J.: The Use of Penicillin Sodium in the Treatment of Sulfonamide Resistant Gonorrhea in Men, *Am. J. Syph., Gonorr. & Ven. Dis.* 27: 525 (Sept.) 1943.

Further studies are being carried out with a view to determining those factors that enhance the chance of cure.

Local Treatment.—For many years Pelouze¹⁸ has been pointing out that complications of gonorrhea often occur as a result of faulty treatment rather than as a natural consequence of the disease, and he has labored to impress on physicians the importance of avoiding manipulative procedures which might traumatize the urogenital tract. During the past year the Army has provided a convincing demonstration of the soundness of that point of view.

As might be expected in a field which is changing so rapidly, practice varies widely from one hospital to another. At one end of the scale are those hospitals in which gonorrhea is treated in the medical service and the patients receive no local treatment whatever. At the other end of the scale are those in which manipulative procedures, instillations and irrigations are utilized in addition to the sulfonamides by mouth. It can be said categorically, it is in those Army hospitals in which reliance is placed on internal medication and forced fluids to the exclusion of local treatment that the best results are being obtained. Nothing appears to be gained by urethral instillations, prostatic massage or the passing of sounds in the ordinary case of uncomplicated gonorrhea, and the proportion of complications appears to be significantly higher where these procedures are employed. Fortunately, practice in the Army is veering sharply away from these methods.

Cases occur, of course, in which some local treatment is indicated, but these are the exception rather than the rule. If a patient with gonorrhea has phimosis or urethral stricture, these anatomic defects must be corrected; but meddling manipulation serves no useful purpose.

Tests of Cure.—Formerly it was the practice in the Army to rely entirely on smears or cultures of the urogenital fluids in determining cure of gonorrhea in the male. These procedures are no longer required in cases which respond promptly to sulfathiazole. Reliance is now placed principally on clinical observation in these cases. The reasons for this change are twofold. First, experience over a period of many months revealed that among patients with uncomplicated gonorrhea who responded promptly to sulfathiazole and who continued to show no evidence of urethral discharge only a small percentage showed gonococci in the prostatic fluid by smear or culture at the end of the third week. Since a large amount of laboratory work was being done in order to detect a negligible number of latent infections, the results were believed not to be commensurate with the work involved. Secondly, for the reasons cited in the foregoing section it is highly desirable to avoid prostatic massage whenever possible.

Patients with acute gonorrhea who respond to sulfathiazole are observed clinically and with the aid of the two glass test of the urine for three weeks and are discharged from observation if asymptomatic at the end of that period. Smears and cultures of the prostatic fluid are still made as a test of cure in those patients who are sulfonamide resistant.

CHANCROID

Among troops stationed in this country chancroidal lesions comprise about 6 per cent of all cases of venereal disease. In certain theaters of operation these lesions present a greater problem. In somewhat over 50 per cent of patients with lesions clinically resembling chancroid there is a favorable response to sulfathiazole. In the remainder the lesions are often quite refractory to treatment. Since the diagnostic methods usually available are often none too reliable, it is possible that more than one etiologic entity is being encountered. Further clinical and bacteriologic studies on this problem are needed.

OTHER VENEREAL DISEASES

Lymphogranuloma venereum and granuloma inguinale are commonly considered as the other members of the group of venereal diseases. The incidence of these two diseases in the Army is relatively low and they have thus far presented no serious problem.

CONCLUSIONS

From recent Army experience in the management of venereal disease, several conclusions may be drawn. First, while the treatment of syphilis has been greatly improved, no method of therapy yet developed is entirely satisfactory. The problem is of sufficient importance to justify speedy exploration of all new leads.

Secondly, biologic false positive serologic tests occur often enough after vaccination procedures and following acute febrile illnesses to constitute a serious diagnostic problem. Under such circumstances follow-up observations are necessary in order to avoid treating individuals for syphilis in the absence of infection.

Thirdly, the treatment of gonorrhea has become largely one of internal medication. Urethral instillations, prostatic massage and the passage of sounds are contraindicated in the early phase of the disease for they frequently induce complications.

Fourthly, penicillin promises materially to change the management of gonorrhea. When supplies of this drug become readily available, sulfonamide resistant gonorrhea should no longer be a problem, and the necessity for long continued treatment or for the use of fever therapy in these cases will have been eliminated.

Finally, certain administrative practices and social attitudes, valid perhaps in an earlier day, are now hampering the full application of the remarkable scientific advances made in the treatment of these diseases. Medical treatment is now so effective that diseased persons can promptly be rendered noninfectious and returned to duty as functioning members of the group. Any measures, therefore, which tend to keep the infected person away from medical care are directly opposed to the best interests of the individual, the organization to which he belongs and the community. Stoppage of pay, prejudicial treatment from employers or superiors, restrictions on advancement, can only serve as powerful factors tempting the individual to conceal his infection and delay treatment until its effectiveness is reduced. The sooner discriminatory practices are abolished and syphilis and gonorrhea regarded as other infectious diseases, the sooner will it be possible to realize the full benefits of recent scientific progress.

18. Pelouze, P. S.: *Gonorrhea in the Male and Female*, ed. 3, Philadelphia, W. B. Saunders Company, 1939

SUBLINGUAL ADMINISTRATION OF DRUGS

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In discussions of therapeutic technics there is frequently recurring opinion to the effect that any of the potent nonirritant drugs may be effectively administered by simple application to the oral mucosa.¹ Very few drugs, however, are routinely used in this way in regular practice. Recently there were recommendations, both in this country² and in England,³ that morphine be administered sublingually in those wartime emergencies in which hypodermic injections were not possible. The recommendation was challenged⁴ and, fortunately, has not been generally accepted. These contradictory opinions demonstrate that there does not exist any clear and general recognition of the scope and limitations of this particular therapeutic technic.

Penetrability of Drugs

Alkaloid	Fat Solu- bility, Mg./Cc.	Water Solu- bility, Mg./Cc.	Fat- Water Solu- bility (Dis- tribu- tion) Cocilli- taneous	Ratio of Sub- lingual to Equally Effec- tive Subcu- taneous Dose	Criterion for Measuring Drug Effects
Cocaine.....	45.0	1.4	32	2	Excellent
Apomorphine.....	1.8	0.09	20	2	Emesis
Diacetylmorphine...	10.0	0.6	17	3	Tolerry fistula tracing
Strychnine.....	3.2	0.12	27	4	Convulsions
Thebaine.....	8.0	0.7	12	4+	Hyperexcitability
Emetine.....	10.0	1.1	9	6+	Emesis
Atropine.....	14.0	1.8	8	8	Tolerry fistula tracing
Morphine.....	0.05	0.22	0.22	10	Tolerry fistula tracing
Dihydromorphinone	0.4	2.0	0.2	15	Tolerry fistula tracing
Codeine.....	16.0	8.0	2.0	15+	Tolerry fistula tracing

The effectiveness or ineffectiveness of this technic can be determined easily and, in fact, has been determined for many of the common drugs. The methods for establishing such data are simple but do involve more than the mere sublingual administration of drugs in their ordinary subcutaneous doses. Sublingual trials with minimally effective doses do not ordinarily permit positive conclusions, and this is the sort of experimentation which has led to the numerous unreliable impressions which have been reported from time to time. This is particularly true if the only criterion of effects is the comment of patients regarding their subjective sensations. To be certain that a drug is not effective by sublingual administration it might be considered necessary that it be administered in doses several times larger than the minimally effective subcutaneous dose. If, for instance, atropine is ineffective in successive trials with increasing sublingual doses up

to 10.0 mg., it can be safely accepted that atropine in ordinary doses (0.5 to 1.0 mg.) is not effective by sublingual application. This sort of experiment might involve some hazard for the human subject, but the hazard actually can be reduced to slight significance by a process of cautiously increasing the doses through successive trials after starting with the ordinary subcutaneous doses. Additionally a method of preliminary animal experimentation is available which has proved to be a reliable guide. Dogs can be managed in such a way as to avoid or minimize swallowing and, as a further method of proof for those few drugs which are well absorbed, dogs can be used after esophageal operations which completely exclude the possibility of swallowed drugs passing into the stomach or intestine. Also in dogs, fistula, tone changes, blood pressure changes, anesthesia, excitation and other methods can be used as a suitable means of bioassaying the extent of drug absorption. Without exception, drugs are more readily absorbed from the sublingual area of the dog than from the same area in man. Hence a drug which does not penetrate the mucosa of a dog can be applied experimentally to the mucosa of human subjects in relatively large doses with assurance that effects will not be obtained.

In the course of experimentation it has been found that the penetration of drugs through the oral mucosa is strictly a selective process. Some few drugs penetrate readily and can be practically administered in this way, others penetrate only when larger doses are applied, while others seem to be almost incapable of any significant degree of penetration. The most important determining factor is the fat-water distribution coefficient. The penetrability of drugs is so conditioned by this simple physicochemical constant that their penetrability may be predicted with fair accuracy in advance of any biologic tests. This is particularly true within a given group of chemically related drugs as, for instance, the group of alkaloids. The accompanying table gives data of this sort for a number of the common alkaloids.⁵ Penetrability, as here determined in dogs, is expressed as the ratio:

$$\frac{\text{Dose producing definite effect}}{\text{Dose producing same effect}}$$

This ratio can be taken as a reasonably satisfactory expression of the ability of a drug to penetrate the oral mucosa; the smaller the factor, the greater the penetrability.

The correlation in the table shows irregularities, and this might naturally be expected from the type of experiments involved. There are obviously several other factors than the one correlated here. The absolute doses, the degree of irritation, the production of salivation, vasoconstrictor effects and other factors are capable of affecting the absorption behavior. With apomorphine and cocaine, for instance, there is a wide disparity of absolute dose in these experiments. This also affects the comparison of codeine and dihydromorphine. With strychnine the intense bitterness no doubt adversely affects its absorption results. Even with this necessary disparity of conditions, the table demonstrates a significant trend which is sufficiently valid to distinguish those drugs which are incapable of practical sublingual administration from those which may possibly be given by this route.

5. Walton, R. P.: Absorption of Drugs Through the Oral Mucosa: III. Fat-Water Solubility Coefficient of Alkaloids, Proc. Soc. Exper. Biol. & Med. 32: 1488, 1933.

From the Department of Pharmacology, Medical College of the State of South Carolina.
1. Fantus, Bernard: Technic of Medication, Chicago, American Medical Association Press, 1938, pp. 233-237. Barth, K.: Die Benutzung der Aufsaugfahigkeit der Mundschleimhaut zur Einverleibung von Heilmitteln und ihr Vorzug, Med. Welt 15: 241, 1941. Kakowsky [Introduction of Drugs into the Organism by Sublingual Administration], Soviet med. 4: 24 (No. 12) 1940. Conferences on Therapy: Routes of Administration of Drugs, J. A. M. A. 114: 1447 (April 13) 1940.
2. Sublingual Administration of Morphine, Queries and Minor Notes, J. A. M. A. 120: 1349 (Dec. 19) 1942.
3. Morphia After Injuries, editorial, Lancet 2: 759, 1942.
4. Davis, David: Administration of Morphine, J. A. M. A. 121: 1316 (April 17) 1943. Davis, David, and Ayman, David: Sublingual Absorption of Drugs: Morphine, Arch. Int. Med. 41: 231 (Feb.) 1928.

A number of the more common drugs can be considered individually and their absorption behavior explained on the basis of this correlation. The following summary is based chiefly on a review of the literature but also includes a number of unpublished observations.

DRUGS WHICH PENETRATE READILY

Organic Nitrates.—Glyceryl trinitrate is the one drug whose absorption by sublingual application has been undisputed over the several decades it has been effectively used in this way. Ample documentary evidence for its absorption has been furnished by Grossmann and Sandor⁶ and by Evans and Hoyle.⁷ Its relatively high solubility in fats (100 mg. per cubic centimeter) is clearly based on its chemical similarity to fats, since it is a triester of glycerin. Its distribution coefficient is exceptionally high, Krantz and his co-workers⁸ reporting it as 1,820.

Erythrityl tetranitrate, being simply a higher homologue of the preceding, has essentially the same type of solubility characteristics. Krantz and his associates report its fat-water distribution coefficient as 290. Its penetrability through the oral mucosa has been demonstrated in human subjects by determinations of blood pressure, observations of face flushing and subjective sensations of head fullness, weakness and headache. Since the blood pressure changes with this drug are very moderate, it is considered that the other criteria are more significant. Eighteen trials in 8 human subjects with doses of 32 to 64 mg. have demonstrated the validity of this method of administration.⁹

Steroid Hormones.—Adequate demonstrations have shown the effectiveness of some of the steroid hormones by this method of administration. This is a development of the past few years and might have been anticipated from the recognized fat solubility of these compounds. Numerous observations, further, have demonstrated the effectiveness of these drugs by percutaneous administration. The range of fat-water distribution coefficient for the various steroid hormones is in the neighborhood of 40 to 2,000 according to data supplied by the Ciba Pharmaceutical Products, Inc.

Androgens.—Testosterone compounds, used in solutions of propylene glycol or in specially prepared compressed tablets, have been shown to be effective by sublingual application.¹⁰ Spence,¹¹ treating a surgical castrate, found that about 10 mg. of methyl testosterone sublingually was equal to 15 mg. swallowed. He considered the sublingual dose of methyl testosterone to be about four times the dose of testosterone propionate intramuscularly. Lissner, Escamilla and Curtis,¹² using propylene glycol solutions of these androgens sublingually, successfully treated 5 typical eunuchoids who

had received previous therapy and 4 previously untreated hypogonadal patients. A solution containing 25 mg. per cubic centimeter was used and total daily doses of 10 to 25 mg. administered. Striking objective and subjective benefits were obtained. In some cases the sublingual effective dose was one-third the similarly effective oral dose, in some cases one-half as much as the oral dose was required and in other cases about as much was required sublingually as orally. The oral dose was considered about twice the intramuscular dose. Sublingually, free testosterone was more effective than either methyl testosterone or testosterone propionate. Lissner and Curtis¹³ subsequently extended these studies to include 12 cases of male hypogonadism and considered that compressed tablets containing 5 mg. each of methyl testosterone were more satisfactory than the propylene glycol solutions.

Salmon and his associates¹⁴ and Joel¹⁵ used androgens sublingually in the management of various gynecologic disorders. Joel described the treatment of 19 such patients, to whom he administered 5 to 30 mg. of methyl testosterone daily. One patient received 900 mg. sublingually in one month and evidenced mild arrhenomimetic effects.

Estrogens.—Miescher and Gasche¹⁶ showed in castrated female rats that estradiol was ten to twenty times more effective sublingually than orally. Numerous observers have reported the clinical effectiveness of various sublingually administered estrogens.¹⁷ Hall¹⁸ and Salmon and Geist¹⁹ showed clinically that α -estradiol in propylene glycol by this route produced typical cornification in the vaginal smear. Salmon and Geist administered daily doses of 0.2 to 0.3 mg. of α -estradiol to 8 patients and at the end of one week showed definite estrogenic effects by vaginal smears and biopsies in all. Hall used a solution containing 0.5 mg. per cubic centimeter in a series of about ninety-eight menopausal types of patients. He considered the sublingual doses about equal to injected doses milligram for milligram.

Endometrial proliferation has been artificially produced in patients by the sublingual administration of α -estradiol. Herrnberger²⁰ and Giesen²¹ obtained these effects with total doses of about 180 mg. Joel,²² however, using a specially prepared tablet, reported similar effects with total doses of only 60 to 90 mg. of α -estradiol. Herrnberger reported that 450 mg. orally ingested would not produce these results. Joel also reported 27 miscellaneous gynecologic cases treated by sublingual α -estradiol and considered that

6. Grossmann, M., and Sandor, J.: *Zus. klinischen Pharmakologie des Nitroglycerins*, Klin. Wchnschr. 2: 1833, 1923.

7. Evans, W., and Hoyle, C.: *Prevention and Treatment of Individual Attacks of Angina Pectoris*, Quart. J. Med. 6: 105, 1933.

8. Krantz, J. C.; Carr, C. J.; Forman, S. E., and Ellis, T. W.: *Alkyl Nitrites*, J. Pharmacol. & Exper. Therap. 67: 191, 1939.

9. Walton, R. P.: *Further Studies Dealing with the Sublingual Absorption of Drugs*, J. Pharmacol. & Exper. Therap. 57: 148, 1936.

10. Hinselmann: *Die perorale und perlingual Verabreichung von Testosteron*, München. med. Wchnschr. 89: 720, 1942. Miescher, K., and Gasche, P.: *Zur lingual Applikation von männlichen Sexualhormon*, Schweiz. med. Wchnschr. 72: 279, 1942. Hurst, Lewis M.: *Sublingual Use of Testosterone*, J. Clin. Endocrinol. 3: 551, 1943.

11. Spence, A. W.: *Sublingual Administration of Methyl Testosterone*, Brit. M. J. 1: 668, 1942.

12. Lissner, Hans; Escamilla, R. F., and Curtis, L. E.: *Testosterone Therapy of Male Eunuchoids*. III. Sublingual Administration of Testosterone Compounds, J. Clin. Endocrinol. 2: 351, 1942.

13. Lissner, Hans, and Curtis, L. E.: *Testosterone Therapy of Male Eunuchoids*. IV. Result from Methyl Testosterone Linguets, J. Clin. Endocrinol. 3: 389, 1943.

14. Salmon, U. J.; Geist, S. H.; Gaines, J. A., and Walter, R. I.: *The Treatment of Abnormal Uterine Bleeding with Androgens*, Am. J. Obst. & Gynec. 41: 991, 1941.

15. Joel, C. A.: *Clinical Results Obtained with Sublingual Administration of Methyl Testosterone*, J. Clin. Endocrinol. 2: 116, 1942.

16. Miescher, K., and Gasche, P.: *Zur lingual Applikation von weiblichem Sexualhormon: Beitrag zur Therapie mit "Ovocyclin Linguetten"*, Schweiz. med. Wchnschr. 72: 490, 1942.

17. Kaufmann, C.: *Kritische Bewertung der Hormontherapie: Häufige Fehler in der Anwendung der weiblichen Keimdrüsenhormone*, Deutsche med. Wchnschr. 67: 1171, 1941. Reifferscheid, W., and Schmidt: *Klin. Wchnschr.* 20: 440, 1942. Hall, G. J.: *Salmon and Geist*, Herrnberger, Giesen, Joel, Castrodale, Loeffel and MacBryde.

18. Hall, G. J.: *Clinical Experiences with Sublingual Administration of Alpha-Estradiol*, J. Clin. Endocrinol. 2: 26, 1942.

19. Salmon, U. J., and Geist, S. H.: *Buccal Absorption of Alpha-Estradiol in Propylene Glycol*, Proc. Soc. Exper. Biol. & Med. 15: 70, 1940.

20. Herrnberger, K.: *Zur Frage der peroralen Wirksamkeit des Follikelhormons (Oestradiol) und des Corpus Luteum Hormons (Progesterone)*, Zentralbl. f. Gynäk. 65: 13, 1941.

21. Giesen, W.: *Beitrag zur Frage der peroralen Wirksamkeit des Follikelhormons*, Deutsche med. Wchnschr. 67: 547, 1941.

22. Joel, C. A.: *Dosage of Female Sex Hormones*, Endocrinol. 2: 620, 1942.

two to three times as much was required by the sublingual route as when estradiol propionate was injected intramuscularly.

Castrodale, Loeffel and MacBryde²³ administered diethylstilbestrol in propylene glycol to 17 women suffering from typical symptoms of estrogen deficiency. A solution containing 20 mg. per cubic centimeter was used and results were judged by relief of symptoms and changes in vaginal smears. All patients were treated for a month or more. Results indicated that the sublingual doses are about equally effective as swallowed doses and half as effective as intramuscular doses.

Anhydrohydroxyprogesterone.—Joel reported that sublingual total doses of 150 mg. of anhydrohydroxyprogesterone produced transformation of the endometrium toward the secretory phase. This he contrasted with oral doses of about 220 to 300 mg. which were required to produce the same effect. The latter oral doses were considered to be five to eight times the injected dose.

Desoxycorticosterone Acetate.—Anderson, Haymaker and Henderson²⁴ administered desoxycorticosterone acetate sublingually to 6 patients with Addison's disease. They used a propylene glycol solution containing 10 mg. per cubic centimeter and administered 2 to 6 mg. daily in divided doses. All patients were reported in excellent condition after six to eight weeks

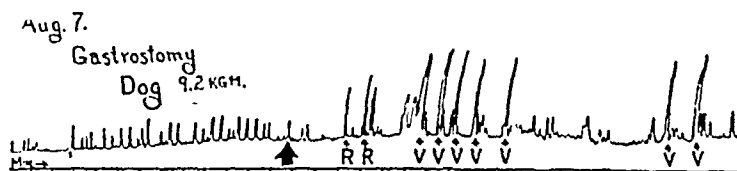


Fig. 1.—Stomach contractions in dog. Recorded by balloon inserted through gastrostomy opening. Apomorphine hydrochloride (0.1 mg. per kilogram) administered sublingually. Retching (R) in two minutes, vomiting (V) in five minutes. Dogs do not usually vomit with ten times this dose by stomach tube.

of such treatment. They considered this method to be quantitatively as effective as the intramuscular or subcutaneous injections of oil solutions of desoxycorticosterone acetate, which had been previously administered to 5 of the 6 patients. They do not consider the oral ingestion of this drug to be satisfactory even when ten times the usual doses are given. Turnoff and Rowntree²⁵ confirmed the satisfactory management of 2 cases of Addison's disease by this same method.

Similarly, Heni²⁶ treated 3 cases successfully and considered that the sublingual dose must be one-third greater than the intramuscular dose. Dunlop,²⁷ working with 7 cases, obtained satisfactory results by application of the drug to the oral mucosa but considered that three to five times as much was required as by the intramuscular route. The use of compressed tablets applied "sublabially" was considered most effective. Wilson²⁸ used propylene glycol solutions in 4

cases and obtained evidence of absorption but not to a degree which was considered satisfactory.

Anderson and Haymaker²⁹ subsequently found it advisable to add up to 20 per cent of alcohol to the solution they had been using. They reported then the management of 17 cases of Addison's disease with this improved solution. Thorn and his associates³⁰ similarly demonstrated the effectiveness of the sublingual route by determinations of sodium chloride excretion. They considered that the sublingual dose is about three to four times that by injection, although Anderson and Haymaker,²⁹ in reviewing their report, insist that with certain precautions the ratio is lower and certainly not more than two to one.

Vitamins.—The fat soluble vitamins no doubt could be administered by sublingual application, although there is ordinarily no need for administration by this route. The effective administration of some of these products by percutaneous application can be taken to demonstrate a high degree of penetrability, although these conditions have important differences. Vitamin A,³¹ vitamin D³² and vitamin K³³ preparations have been shown recently to be effective by percutaneous application.

Alkaloids.—Apomorphine, although very slightly soluble in fats, is extremely insoluble in water, with the result that its distribution coefficient is relatively high.⁵ Its penetration through the oral mucosa of the dog is good, and consistently effective sublingual doses are only twice the subcutaneous doses. There is no possibility that swallowing explains these effects, since approximately ten times as much as the subcutaneous dose is necessary if the drug is given by stomach tube. The high degree of absorption of apomorphine through other mucosae has been described by Macht.³⁴ When administered to human subjects by sublingual application, doses of 6.5 to 10 mg. produced moderate to intense nausea and depression in six of eight trials.³⁵ It is evident that this drug can be effectively administered sublingually if doses about twice the subcutaneous dose are used. The circumstances, however, would be exceptional under which the sublingual application of apomorphine could prove practically useful.

Nicotine passes through the oral mucosa with considerable ease and promptness, which is chiefly a point of toxicologic interest. Franke and Thomas³⁶ have shown that the minimum fatal sublingual dose in unanesthetized dogs is 10 mg. per kilogram, which is only about three times the minimum fatal dose by intravenous injection. The oral use of tobacco products as an indulgence undoubtedly involves some direct absorption of nicotine through the buccal mucosa. Nicotine is something of an exception to the proposed correlation, since its fat-water distribution coefficient

29. Anderson, Evelyn, and Haymaker, Webb: Technic of Sublingual Administration of Desoxycorticosterone Acetate in the Treatment of Addison's Disease, *Clinics* **1**: 476, 1942.

30. Thorn, G. W.; Greif, R. L.; Coutinho, S. O., and Eisenberg, H.: Relative Effectiveness of Several Methods of Administering Desoxycorticosterone Acetate: Addison's Disease, *J. Clin. Endocrinol.* **1**: 967, 1941.

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32. Eller, J. J., and Wolff, Shirley: Hormones and Vitamins in Cosmetics, *J. A. M. A.* **114**: 1865 (May 11); 2002 (May 18) 1940.

33. Vollmer, Hermann; Abler, Charles, and Altman, H. S.: Percutaneous Administration of Vitamin K, *Am. J. Dis. Child.* **64**: 462 (Sept.) 1942.

34. Macht, D. I.: Absorption of Drugs and Poisons Through the Skin and Mucous Membranes, *J. A. M. A.* **110**: 409 (Feb. 5) 1938.

35. Walton, R. P., and Lacey, C. F.: Absorption of Drugs Through the Oral Mucosa, *J. Pharmacol. & Exper. Therap.* **54**: 61, 1935.

36. Franke, F. E., and Thomas, J. E.: Minimum Fatal Dose of Nicotine for Unanesthetized Dogs, *Proc. Soc. Exper. Biol. & Med.* **29**: 1177, 1932.

23. Castrodale, D.; Loeffel, E., and MacBryde, C. M.: Sublingual Administration of Diethylstilbestrol: Comparison of Routes in Therapy, *J. Clin. Endocrinol.* **2**: 569, 1942.

24. Anderson, Evelyn; Haymaker, Webb, and Henderson, Edward: Successful Sublingual Therapy in Addison's Disease, *J. A. M. A.* **115**: 2167 (Dec. 21) 1940.

25. Turnoff, David, and Rowntree, L. G.: Successful Sublingual Therapy in Addison's Disease, *J. A. M. A.* **116**: 2016 (May 3) 1941.

26. Heni, F.: The Sublingual Administration of Desoxycorticosterone in the Treatment of Addison's Disease, *Deutsche med. Wchnschr.* **68**: 162, 1942.

27. Dunlop, D. M.: Desoxycorticosterone Acetate in Addison's Disease, *Brit. M. J.* **1**: 557 (May 8) 1943.

28. Wilson, A.: Sublingual Therapy in Addison's Disease, *Lancet* **1**: 702, 1942.

is low (2.6). It is, however, completely miscible with fat in all proportions, and its behavior may thus be considered more as a modification of the correlation than as a contradiction. Thus, to state the correlation more completely, it could be said that the penetrability of drugs through the oral mucosa is favored by a high fat-water distribution coefficient or an exceptionally high fat solubility.³⁷ In addition to the unique solubility of nicotine in fats, this alkaloid is unusually alkaline and irritant. The latter feature is possibly an important conditioning factor in its high degree of penetrability.

Cocaine is another drug whose absorption through the buccal mucosa is chiefly a matter of toxicologic interest. Its distribution coefficient is relatively high (32), and in dogs excitement effects can be produced by sublingual doses which are only twice the subcutaneous dose.³⁸ In human subjects the absorption of cocaine through the more permeable nasal mucosa is well known.

DRUGS WHICH DO NOT PENETRATE THE ORAL MUCOSA IN ANY PRACTICAL DOSAGE

Of the very considerable number of drugs which are nonirritant and which are effective in small doses, most have been claimed at various times to be effective by sublingual application.¹ It may be accepted, however, that if they do not exhibit a high distribution coefficient or a high fat solubility they are not effectively administered in this way, and any effects which may have been obtained in this way are due to small amounts having been swallowed.

Morphine Derivatives.—Morphine, codeine and dilaudid have low distribution coefficients (less than 2) and are very slightly soluble in oil. From observations with trained Thierry fistula dogs it has been demonstrated that they do not pass through the oral mucosa to any significant degree. In dogs, sublingual doses ten or more times greater than the subcutaneous doses were necessary in order to obtain typical effects. (With these three drugs, by sublingual, stomach tube and subcutaneous routes, tracings were obtained, each following a preliminary control period of regular peristaltic waves.³⁴ I consider the latter type of control more or less obligatory when Thierry fistula tracings are made for the purpose of semiquantitative evaluation.³⁷ In human subjects sublingual doses were successively increased to 120 mg. with morphine and to 15 mg. for dilaudid. No subjective effects were obtained from these sublingual doses, although these doses were ten or more times greater than trial subcutaneous doses which produced recognizable subjective effects.

According to the correlation of the table it is evident that diacetyl morphine is the only morphine derivative in this group which might reasonably be expected to be effective by this sublingual route. It is a diester and hence more related to typical fats than the other derivatives and, as expected, has a higher distribution coefficient (17). Its sublingual absorption in dogs supports the correlation, and consistent effects were obtained with doses only three to four times greater than the subcutaneous dose (conclusion based on tracings with Thierry fistula dogs).³⁸ Suggestive but inconsistent effects were obtained in human trials with

sublingual doses up to 15 mg. Definite subjective and objective effects (stomach spasm as shown by balloon tracings) were obtained with 1.5 to 4 mg. subcutaneous doses in some of the same subjects. Since this is the only morphine derivative which has even suggestive possibilities of practical administration in this way, further experiments were directed toward methods which might increase penetrability. A number of trials were made in Thierry fistula dogs using 40 per cent alcoholic solutions of the drug. No significant increase in penetrability was noted. Similar solutions in human subjects did not produce definite effects in doses up to 25 mg. Mixtures made up with bile salts did not give consistent or definite effects in doses of 10 mg. to 15 mg. Mixtures made up with 7 parts of propylene glycol and 3 parts of an aqueous solution of 2 to 10 per cent sodium carbonate gave inconsistent and only slightly suggestive subjective effects in doses of 15 mg. With the latter dose mixture, fourteen trials were made in 11 subjects.³⁹

The conclusion stands clearly that these opiates cannot be administered sublingually by any of the currently used technics. That member of these four morphine derivatives, diacetyl morphine, which by *in vitro* and by animal experiments clearly indicated the

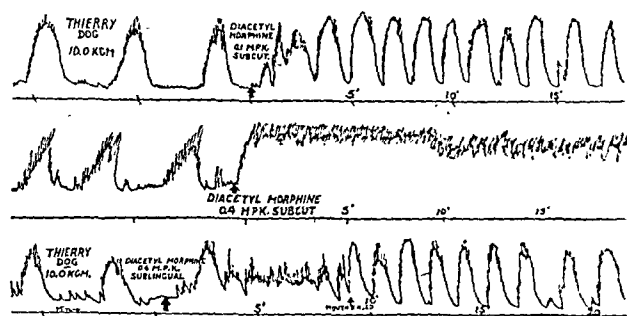


Fig. 2.—Thierry fistula tracings each from same dog: Top, diacetyl-morphine hydrochloride (0.1 mg. per kilogram) subcutaneously; moderate stimulation. Middle, ditto with 0.4 mg. per kilogram subcutaneously; pronounced effect. Bottom, ditto with 0.4 mg. per kilogram sublingually; effect comparable to that with 0.1 mg. per kilogram subcutaneously.

highest degree of penetrability, was not satisfactorily effective in human subjects with relatively extreme doses, and in special mixtures which in some cases were too irritant for ordinary use.

Ergot Alkaloids.—Ergonovine has characteristics which make it a good test of the validity of the correlation. By other counts it should be well suited for sublingual administration; it is effective in very small doses (0.2 mg.), it is known to be absorbed exceptionally well after swallowing, its salts are highly water soluble and such concentrated solutions can be administered without irritation. Its distribution coefficient, however, is very low and, in agreement with the correlation, our observations show it to be ineffective by sublingual application.

Pressure tracings made with balloons in uterine fistulas of dogs have shown that large sublingual doses were ineffective under conditions in which one-fifth the same doses subcutaneously produced definite effects. In human male subjects nine trials in 4 persons with doses from 0.5 to 2.5 mg. of ergonovine maleate produced no more than barely recognizable subjective sensations in 1 or 2 instances.³⁹ This is in contrast to a clinical series with ergonovine intravenously in

37. Walton, R. P., and Lacey, C. F.: A Comparison of the Motor Effects of Morphine, Codeine and Dihydromorphine Hydrochloride (Dilaudid) on Thierry Fistulae, *J. Pharmacol. & Exper. Therap.* 54:53, 1935.

38. Walton, R. P.: Absorption of Drugs Through the Oral Mucosa, *Proc. Soc. Exper. Biol. & Med.* 32: 1486 and 1488, 1935.

39. Walton, R. P.; Smith, J. B., and Cook, T. M.: Absorption of Ergot Alkaloids, *J. Pharmacol. & Exper. Therap.* 66:37, 1934.

104 patients, 50 per cent of whom were nauseated and 18 per cent of whom vomited.¹⁰ Subcutaneous doses of the amount used in our sublingual trials cause intense nausea, tingling in the extremities, cerebral excitation and precordial oppression.

In some of the earlier clinical experiments with ergonovine¹¹ results were reported which indicated the effectiveness of its sublingual administration and, in

fact, it has been an occasional practice to administer it in this way in some of the larger obstetric clinics of this country. I cannot reconcile this practice with our observations and suggest that the clinical results must have been due to swallowing

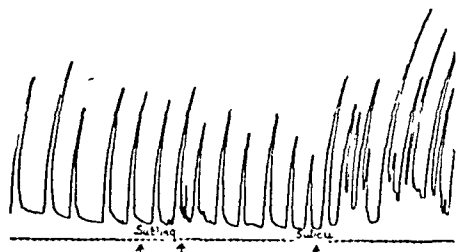


Fig. 3.—Uterine contractions in 15 Kg. dog under pentobarbital light anesthesia. Ergonovine maleate in sublingual dose of 0.4 mg. per kilogram has no effect, while subsequent subcutaneous administration of same dose produces definite stimulation.

Ergotamine exhibits an indicated distribution coefficient which puts it in the borderline group deserving a trial by the sublingual method. The need for its repeated administration in the management of some migraine cases makes this technic an attractive one. The limited water solubility of its salts, however, makes it difficult to administer enough to be effective by this route. Kelly¹² concluded from experiments on himself that two tablets of ergotamine sublingually were equal to five or six orally. Von Storch,¹³ working with a number of migraine patients, found it necessary to give six to eight times as much by sublingual as by subcutaneous administration. If a sufficiently water soluble salt of ergotamine should be developed, it might possibly be given routinely in this way.

Autonomic Drugs.—With atropine, in vitro and animal observations indicate a low degree of penetrability. Definite effects in human subjects were obtained only after the dose had been increased to a degree which would have been dangerous if the drug was swallowed (12 to 15 mg.). Such effects as are obtained with these larger doses may be attributed to possible swallowing of a small fraction of the drug. It is conceivable that, among the various synthetic and natural products which have pharmacologic similarity to atropine, some may be found which have an adequate degree of penetrability. No systematic study of this sort has been made. Wallgren¹⁴ has reported the effective lingual application of eumydrin in the management of congenital pyloric stenosis. His results were probably due to the drug being swallowed.

Mecholin has been shown to produce typical effects (salivation, defecation, miosis) in dogs by sublingual application but only in doses considerably larger than the subcutaneous dose producing the same effects. Relatively large doses (up to 400 mg.) had no effect when administered sublingually to human subjects.

Barbiturates.—The sodium salts of two barbiturates, pentobarbital³⁵ and 1-methyl-butyl methallyl barbiturate⁹ have been shown to produce surgical anesthesia in dogs by sublingual application. These anesthetic effects, involving a total of fifty-five experiments, were obtained more rapidly by sublingual application than by stomach tube administration, and these anesthetic effects were also obtained equally well in dogs with esophageal fistulas. This necessitated the passage of considerable quantities of drug through the oral mucosa. In the case of pentobarbital at least 250 mg. passed directly through the mucosa of a 10 Kg. dog, since this is the minimum dose producing anesthesia by intravenous injection. Despite these demonstrations of the direct passage of impressively large quantities through the oral mucosa, it is not considered practical to administer these drugs by this method. The penetration obtained in dogs was undoubtedly due in a large measure to the irritant action of these alkaline sodium salts. In human trials, sedative effects were obtained only with 250 mg. doses of sodium pentobarbital and, this involved an unacceptable degree of mucosal irritation.

Analeptics.—Strychnine and picrotoxin both produced convulsions in dogs when simply applied to the oral mucosa. The picrotoxin was administered in mixtures of alcohol or propylene glycol with water. On the basis of one hundred and three experiments in dogs it has been concluded that the sublingual/subcutaneous ratio of effective doses is four for strychnine and six for picrotoxin.⁴⁵ This indicates that dangerously large doses would be needed in order to obtain penetration of effective doses through the oral mucosae of human subjects. Epinephrine by sublingual application in dogs does not produce effects in doses two hundred and fifty times greater than the intravenous dose producing recognizable effects (depression of motor activity of intestinal fistulas). In human subjects, sublingual doses of 3 mg. were without effect although the same subjects showed definite responses to one-tenth that amount by subcutaneous injection.³⁵ A recent statement⁴⁶ that asthmatic infants respond to

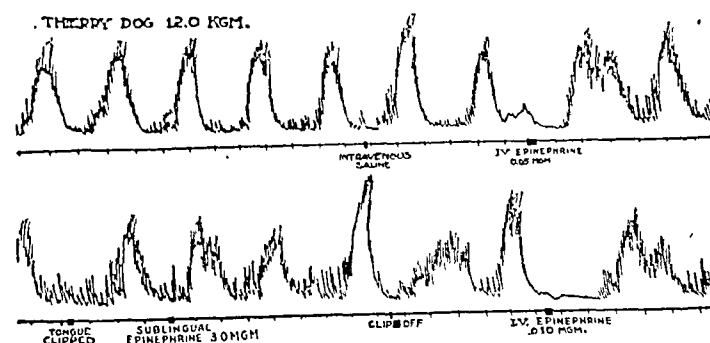


Fig. 4.—Thierry fistula tracing (continuous). Epinephrine in doses of 0.05 mg. and 0.10 mg. intravenously produces brief but definite depression of intestinal activity. Dose of 3.0 mg. sublingually during interval between injections does not produce recognizable depression.

sublingual doses of 1.5 mg. of epinephrine is interesting since it is possible that penetration is more easily obtained in infants. The difference, however, would have to be very great in order to reconcile this statement with the observations that I have made. Ephedrine exhibits more promising solubility characteristics than epinephrine, but a limited number of experiments

40. Lennox, W. G.: Ergonovine versus Ergotamine as Terminator of Migraine Headaches, *Am. J. M. Sc.* **195**: 458, 1938.

41. Adair, F. L.; Davis, M. E.; Kharasch, M. S., and Legault, R. R.: Study of New and Potent Ergot Derivative, Ergotocin, *Am. J. Obst. & Gynec.* **30**: 466, 1935.

42. Kelly, T. W. G.: Ergotamine Tartrate in Migraine, *Lancet* **1**: 777, 1937.

43. Von Storch, T. J. C.: Complications Following the Use of Ergotamine Tartrate, *J. A. M. A.* **111**: 293 (July 23) 1938.

44. Wallgren, A.: Lingual Application of Eumydrin in Treatment of Congenital Pyloric Stenosis, *Arch. Dis. Childhood* **15**: 103, 1940.

45. Walton.⁹ Walton and Lacey.³⁵

46. Beckman, H.: Treatment in General Practice, Philadelphia, W. B. Saunders Company, 1942, p. 360.

with dogs and with human subjects showed that its degree of penetration was low.

Metrazol and hydrocyanic acid can be shown to produce their typical effects in dogs by sublingual administration, but the degree of penetrability is not striking and no effects were obtained in human subjects with relatively large doses. Kuschel⁴⁷ demonstrated perlingual absorption of metrazol in cats. The required doses, however, were of about the same order as my associates and I found in dogs.

Cardiac Glucosides.—Since the cardiac glucosides are effective in very small doses they might be considered suitable for this type of administration, and some writers have claimed this to be the case. The solubility characteristics, however, are clearly unfavorable and a very conclusive study by Eggleston and White⁴⁸ has demonstrated the lack of penetrability of amorphous strophanthin. These observers applied relatively large doses of an alcohol solution of strophanthin to the oral mucosa of 18 patients with cardiac decompensation. No effects were obtained, although subsequent administration of digitalis in the usual way was followed by definite and typical effects. Digitoxin has somewhat better promise based on solubility characteristics, but a few preliminary trials of its alcoholic solution in dogs indicated to us that it would not be effective sublingually in any practical dosage.

Insulin is protein in character and hence would not be expected to exhibit favorable oil solubility. In dogs, no effects were obtained by sublingual application of doses twenty times greater than those which produced pronounced hypoglycemia by subcutaneous injection.⁴⁹ McCullagh and Lewis⁴⁹ also found that the sublingual technic was ineffective in dogs. They further demonstrated the ineffectiveness of the sublingual technic in 4 human subjects, including 1 who was diabetic. Their observations satisfactorily refute the several unimpressive reports which have claimed the successful sublingual administration of insulin.⁵⁰

COMMENT

These observations show that the fat-water distribution coefficient of drugs is a dominant factor in determining their penetrability through the oral mucosa.

With the drugs so far studied, coefficients of approximately 20 to 30 fall in the borderline range of effective administration by sublingual application. A number of the common drugs with lower coefficients have been shown to be ineffective by sublingual application. Some of the organic nitrates and the steroid hormones have been effectively administered sublingually, and their coefficients fall in the range of 40 to 2,000. This may be considered an optimum range. It is probable that drugs with coefficients higher than this range may not be effective, in which case the explanation would be that adequate concentrations could not be obtained in the aqueous salivary fluids of the mouth.

In the table the solubilities are those of the free alkaloids or bases, while the measurements of penetrability were made with soluble salts of the alkaloids. Since the correlation set up in this way is clearly a

valid one, it may be concluded that the salt dissociates and allows the free base to act in the mouth as it does in the in vitro oil-water system. Apparently, in the mouth, the same conditions of competition of solvents prevails and, in this case, the predominant competition is that between the aqueous salivary fluids and the fat in the protoplasm of the cells. The solubilities of the alkaloidal salts seem to have no significance in this problem beyond the need for enough water solubility that a reasonably concentrated water solution can be administered.

Experimentally, it was found that there was no special penetrability to be obtained by using the free alkaloid rather than the soluble salts. To use the free alkaloid, solutions in water and alcohol or in water and propylene glycol were employed. The further admixture with alkalis and with surface active agents such as bile salts provided no significant improvement in penetrability. Some have suggested that the different areas of the buccal mucosa should be studied to determine differences in penetrability. It is doubtful, however, that this will lead to any improved technic, since we found, at least, no advantage in perlingual over sublingual application.

The most feasible method for improving the sublingual penetrability of a given drug seems to be the preparation of chemical derivatives with more favorable solubility characteristics. Nitrate and acetate esters, for instance, will exhibit a significantly improved distribution coefficient, and in some cases the typical activity of the original drug can be retained or even intensified. This procedure would be most applicable in the case of those drugs which are on the borderline of effective penetrability. It is suggested here that in the synthetic preparation of new drugs and in the chemical variations of the standard drugs this particular feature might be advantageously added to other objectives.

SUMMARY AND CONCLUSIONS

The sublingual administration of drugs is a simple and, at times, an advantageous technic for those few drugs with an adequate degree of penetrability. The majority of drugs, however, do not penetrate the oral mucosa in significant amounts, and it is unsound practice to rely on this technic with any drug whose effectiveness by this route has not been conclusively demonstrated.

A simple in vitro correlation, depending on solubility characteristics, largely determines the ability of drugs to penetrate the oral mucosa. As new drugs are developed, it is suggested that those which give promise according to this criterion be subjected to adequate trial by absorption experiments in animals and human subjects.

Orthopedics.—The word orthopaedic was compounded in 1741 by the Parisian physician Nicolas André from the Greek roots *orthos*, meaning straight, and *païs*, meaning child. He used it in a treatise on skeletal deformities which he attributed to muscle imbalances during childhood. The word has survived, while André's theory has long since been discarded. Today the word has a quite different meaning. Orthopedics is the branch of medicine that deals with diseases and injuries of bones and joints, including deformities, both congenital and acquired, fractures and dislocations. The orthopedist is a surgeon rather than a physician prescribing corrective exercises as André had intended.—Haagensen, C. D., and Lloyd, Wyndham E. B.: *A Hundred Years of Medicine*, New York, Sheridan House, Inc., 1943.

47. Kuschel, H.: Ueber die Wirkung von Cardiazol bei enteraler und perlingualer Zufuhr, Arch. f. exper. Path. u. Pharmacol. 193: 330, 1939.

48. Eggleston, Cary, and White, T. J.: Absorption of Strophanthin Following Sublingual and Perlingual Administration, J. A. M. A. 80: 583 (Aug. 20) 1927.

49. McCullagh, E. P., and Lewis, L. A.: Comparison of Effectiveness of Various Methods of Administration of Insulin, J. Clin. Endocrinol. 2: 435, 1942.

50. Fantus, J. McCullagh and Lewis.⁴⁹

COMBINED PENICILLIN AND HEPARIN THERAPY OF SUBACUTE BAC- TERIAL ENDOCARDITIS

REPORT OF SEVEN CONSECUTIVE SUCCESSFULLY
TREATED PATIENTS

LEO LOEWE, M.D.
PHILIP ROSENBLATT, M.D.
HARRY J. GREENE, M.D.
AND
MORTIMER RUSSELL
BROOKLYN

In experimental thrombotic bacterial endocarditis¹ the disappearance of vegetations requires the use of a suitable chemotherapeutic agent and an anticoagulant. The clinical application of this principle in subacute bacterial endocarditis has been disappointing; the techniques of therapy are cumbersome, the toxicity of treatment has been excessive even for an otherwise fatal disease and the successes have been few and irregular.² Early efforts made with sulfonamides, with or without heparin, have been mostly abandoned. The introduction of penicillin proved equally disappointing; the commission appointed by the National Research Council has already reported unfavorably and discouraged the use of the at present inadequate supply of the drug for the treatment of viridans endocarditis.³

The present report, which deals with the apparently successful treatment of 7 consecutive examples of subacute bacterial endocarditis, employs variations on previous techniques. Penicillin⁴ is used to replace sulfonamide in the conjoint chemotherapeutic-anticoagulant attack and prolonged heparinization⁵ has been accomplished primarily by a special method devised for the subcutaneous deposition of the drug.⁶

CLINICAL MATERIAL

Six of the 7 patients⁷ suffered from a bacterial endocarditis that was engrafted on a chronic rheumatic valvulitis, and the other had a congenital cardiac defect. In 5 of the 7 patients the etiologic organism was a *Streptococcus viridans*; the sixth patient had a hemolytic streptococcus and the seventh a pneumococcus type 27.

TECHNIC OF TREATMENT

Probatory sensitivity tests were performed in each instance. The bacteria were inhibited within the dilution of 0.007 to 0.01 Florey units per cubic centimeter of penicillin. The daily dosage of penicillin varied from

40,000 to 200,000 Florey units and the total ranged from 867,920 to 7,890,340 Florey units. The heparin dosage approximated 300 mg. every second day when given subcutaneously and 200 mg. daily when incorporated in the venoclysis.

Heparinization was checked by the Lee-White modification of Howell's method for determining blood coagulation time.⁸ A reading of thirty to sixty minutes was regarded as satisfactory evidence of anticoagulant activity. The present technic has minimal toxicity; it is simple of accomplishment and the immediate results, at least, appear to be uniformly successful.

CASE REVIEWS

CASE 1.—Subacute bacterial endocarditis, pneumococcus type 27, ten weeks; congenital cardiac anomaly (septal defect); post-therapy, five months, clinically well and blood stream sterile.

I. Z., a girl aged 7½, was admitted to the Jewish Hospital of Brooklyn on June 3, 1943 because of chills and fever of ten weeks' duration. At the age of 9 months a loud precordial murmur was found on routine physical examination. Three years before admission she had a bout of unexplained fever lasting eight weeks. She remained perfectly well thereafter until ten weeks before admission, when she developed an

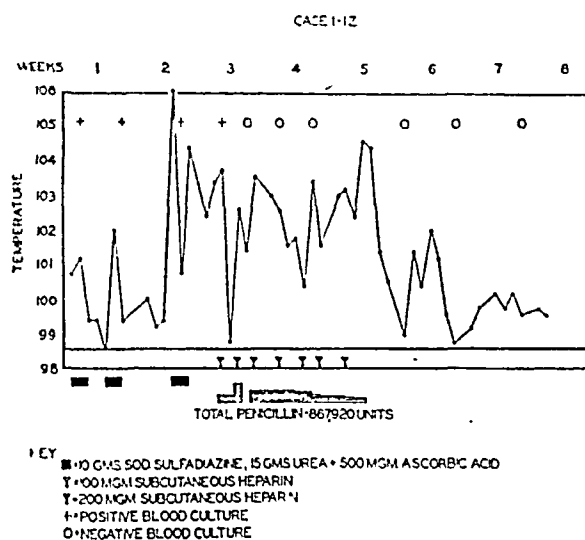


Chart 1.—Temperature and dosage in case 1.

earache and low grade fever lasting three days. Two days after this subsided she suddenly developed a high temperature, which was spiking in character and continuous to the time of admission. She also had intermittent chills. Four weeks prior to hospitalization she developed lobar consolidation (infarct?) which persisted ten days. She lost 13 pounds (6 Kg.) in the last ten days.

On admission the temperature was 103.8 F., pulse 132 and respirations 32. Blood pressure was 110/90. The heart was slightly enlarged to the left, and a loud systolic murmur was heard all over the precordium. The spleen was just palpable on inspiration. The clinical impression was subacute bacterial endocarditis engrafted on a congenital cardiac anomaly (septal defect). Blood culture, taken on June 4, revealed pneumococcus, type 27. Massive sulfonamide therapy⁹ was begun June 4, consisting of 10 Gm. of sodium sulfadiazine, 15 Gm. of urea and 500 mg. of ascorbic acid dissolved in 650 cc. of distilled water administered by venoclysis. Six such courses were given over a period of twelve days without improvement. Blood cultures taken on June 9, 14 and 18 remained positive for pneumococcus type 27. Sulfadiazine blood levels ranged up to 78.8 mg. per hundred cubic centimeters total and 74.2 mg. per hundred cubic centimeters free. In view of the lack of response to this therapy, a combined penicillin-heparin regimen was initiated June 19. The patient received subcutaneous

From the Department of Medicine and the Department of Laboratories, Jewish Hospital.

1. Loewe, Leo; Rosenblatt, Philip, and Lederer, Max: Experimental Thrombotic Bacterial (*Streptococcus Viridans*) Endocarditis in the Rabbit, *Am. J. Path.*, to be published.

2. Kelson, S. R., and White, P. D.: A New Method of Treatment of Subacute Bacterial Endocarditis, *J. A. M. A.* **113**: 1700-1702 (Nov. 4) 1939. McLean, Jay; Meyer, B. B. M., and Griffith, J. M.: Heparin in Subacute Bacterial Endocarditis, *ibid.* **117**: 1870-1875 (Nov. 29) 1941.

3. Keefer, C. S.; Blake, F. G.; Marshall, B. K., Jr.; Lockwood, J. S., and Wood, W. B., Jr.: Penicillin in the Treatment of Infections, *J. A. M. A.* **122**: 1217-1224 (Aug. 28) 1943.

4. The entire supply of penicillin for this project was obtained from the Charles Pfizer Company of Brooklyn. Mr. J. L. Smith and Dr. W. J. Smith of that organization showed keen interest and close cooperation.

5. Roche-Organon, Inc., Nutley, N. J., supplied all the heparin (Liquaemin) for both the subcutaneous and the intravenous administration of the drug. Drs. Ralph D. Shaner and Leo Pirk of that company were especially cooperative.

6. Loewe, Leo; Rosenblatt, Philip, and Lederer, Max: A New Method of Administering Heparin, *Proc. Soc. Exper. Biol. & Med.* **50**: 53-55, 1942. Loewe, Leo, and Rosenblatt, Philip: A New Practical Method for Subcutaneous Administration of Heparin, *Am. J. M. Sc.*, to be published.

7. This series of cases was recruited mostly from the medical services of Drs. A. L. Louria, M. A. Rabinowitz, J. Rosenthal and E. L. Shlevin. We wish to thank them for the privilege of utilizing this clinical material.

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deposits of 100 or 200 mg. of heparin approximately every other day. During the first twenty-four hours, 42,400 Florey units of penicillin dissolved in 2,000 cc. of 5 per cent dextrose in saline solution was given intravenously by slow drip. On June 20 and 21 42,400 and 129,600 units respectively were administered by vein. The venoclysis was then discontinued because the patient became extremely uncooperative. Blood culture on June 21 showed no growth. Although her general condition was good the temperature persisted and it was decided to resume penicillin therapy by the intramuscular route. On June 24 penicillin was again started with 64,800 Florey units in fractional intramuscular dosage. Combined penicillin-heparin therapy was then continued without interruption until July 5, a total of 867,920 units of penicillin and 1,200 mg. heparin being given over a period of sixteen days. On June 27 her temperature, although still elevated, was on a lower level. On June 29 she showed evidence of extensive infarction of the lower two thirds of the right lung. Blood cultures taken on June 28, July 6 and July 19 were sterile. On July 22 her general condition was good, a slight elevation of temperature to about 100 F. being ascribed to a cold which she developed. She was discharged July 23 for further convalescence at home. Since then she has been seen periodically, her temperature remaining normal and the blood cultures negative. She is now attending school regularly.

CASE 2.—*Subacute bacterial endocarditis, Streptococcus viridans, ten months; chronic rheumatic cardiovalvular disease, aortic; no response to massive sulfonamide and three courses of penicillin-heparin therapy; fourth course of penicillin-heparin therapy successfully sterilized blood stream; clinically much improved.*

S. R., a man aged 34, was referred to the Jewish Hospital of Brooklyn by Dr. I. L. Epstein on Feb. 7, 1943 complaining of fever and cough of six weeks' duration. At the age of 13 he had spent two months in bed because of "an inflamed heart chamber" and joint pains. At the time a diagnosis was made of rheumatic heart disease. The patient was well until about six weeks before admission, when he developed a cough followed by persistent low grade fever, which continued despite oral sulfadiazine. There were no physical signs apart from a systolic murmur at the mitral area and a diastolic murmur at the aortic area. The admission diagnosis of subacute bacterial endocarditis was confirmed by blood cultures taken February 10 and 12, both of which were positive for *Streptococcus viridans*. On February 22 he was given 18 Gm. of sodium sulfapyridine by intravenous drip, which failed to sterilize the blood stream. Supplemental fever therapy through the medium of intravenous triple typhoid vaccine was instituted March 8. Sulfadiazine levels were maintained around 20 mg. per hundred cubic centimeters, and fever treatments were

levels reached as high as 123 mg. per hundred cubic centimeters total and 109 mg. per hundred cubic centimeters of free sulfadiazine. Despite nineteen such intensive courses of treatment over a period of six weeks the blood cultures on May 22 and on June 9 and 16 were richly positive. On June 19 a three day course of penicillin-heparin therapy was initiated, which was obviously inadequate. When additional penicillin supplies were available on June 27 the patient was started

on a nine day schedule comprising approximately 40,000 units of penicillin daily by vein and 300 mg. of heparin deposited every other day under the skin. When the blood cultures remained positive, massive sulfonamide therapy was again projected. From July 7 to August 17 he received variously sodium sulfadiazine, sodium sulfapyridine, sodium sulfathiazole

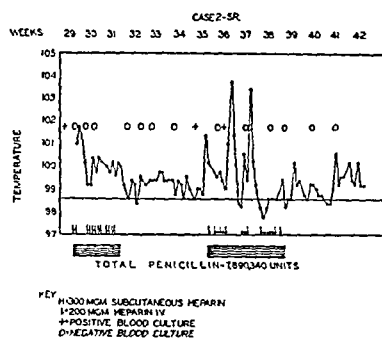


Chart 3.—Remainder of course in case 2.

and sodium sulfamerazine without sterilization of the blood stream. On August 27 a more elaborate course of penicillin-heparin therapy was begun with 200,000 units of penicillin daily by venoclysis and 300 mg. of heparin subcutaneously approximately every other day. This was continued for fourteen days, after which the blood cultures remained negative until October 4, when organisms reappeared. The temperature, which had been flat for weeks (charts 2 and 3) now showed some irregularity, and on October 9 a fourth course of penicillin-heparin was initiated. The daily dosage plan consisted of 200,000 units of penicillin and 200 mg. of heparin given together by continuous venoclysis for a period of twenty-four days. The occasional sharp febrile rises due to heparin receded promptly following temporary withdrawal of the drug. Since completion of the therapeutic program the temperature has remained normal with the exception of a slight fever due to a complicating nasopharyngitis. The blood cultures since October 13 have been sterile; the sedimentation rate receded from a high of 130 mm. per hour on June 14 to 10 mm. per hour on November 26 and the patient is in excellent condition. In all, this patient received four courses of combined therapy totaling 7,890,340 Florey units of penicillin and 7,100 mg. of heparin.

CASE 3.—*Subacute bacterial endocarditis, Streptococcus viridans, eight months; chronic rheumatic cardiovalvular disease, mitral and aortic; three cycles of penicillin-heparin therapy; no clinical or laboratory evidence of bacterial activity for four months.*

L. O., a woman aged 24, unmarried, was admitted to the Jewish Hospital of Brooklyn on April 16, 1943. Her first attack of rheumatic fever, of which she had three or four, occurred at the age of 7. Her present illness began in December 1942 with complaints of chills, fever, malaise, pain in the hip and occasional crops of petechiae on the arms. She did not improve with home care and finally entered the Mount Sinai Hospital of Cleveland, where the diagnosis of subacute bacterial endocarditis due to *Streptococcus viridans* was established. This diagnosis was substantiated, clinically and bacteriologically, at the Jewish Hospital. A rough systolic thrill over the aortic area and systolic and diastolic murmurs, loudest at the base, indicated a predominant aortic valve lesion. There were several petechiae on the fingers. The spleen was not palpable. The patient's condition did not change materially following intensive oral and parenteral administration of sulfadiazine, which achieved blood levels of 41.2 mg. per hundred cubic centimeters total and 37.0 mg. per hundred cubic centimeters free. Fresh petechiae appeared occasionally, and the temperature swung irregularly up to 103 F. From May 17 until July 31, when the penicillin-heparin program was started she received fifteen courses of sulfadiazine, each treatment comprising 10 to 20 Gm. of sodium sulfadiazine, 15 to 30 Gm.

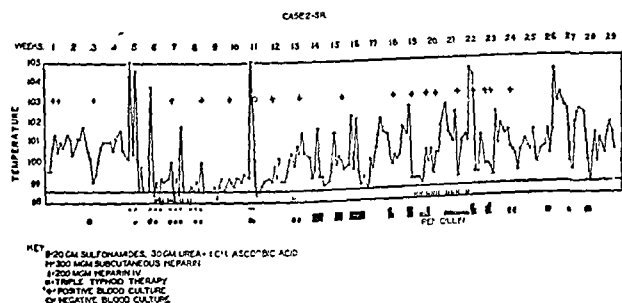


Chart 2.—First twenty-eight weeks in case 2

given approximately every other day. After three such pyrexia reactions heparin was added to the program. However, on March 23 and April 5 and 14 *Streptococcus viridans* was recovered from the blood stream despite adequate fever therapy and intensive sulfadiazine medication, which had attained blood levels up to 40 mg. per hundred cubic centimeters. Sulfathiazole-fever therapy was similarly ineffectual. On May 4 massive cyclic intravenous chemotherapy was started with sodium sulfadiazine, the individual dose approaching 40 Gm. Urea and ascorbic acid were frequently employed as adjuvants. Blood

of urea and 0.5 to 1 Gm. of ascorbic acid given together by venoclysis. The complete lack of response, clinical and bacteriologic, to this massive chemotherapy justified the adoption of the penicillin-heparin regimen. The initial course of the latter lasted for nine days and consisted of 60,000 to 100,000 units of penicillin daily by continuous venoclysis and 100 or 200 mg. of heparin subcutaneously approximately every other

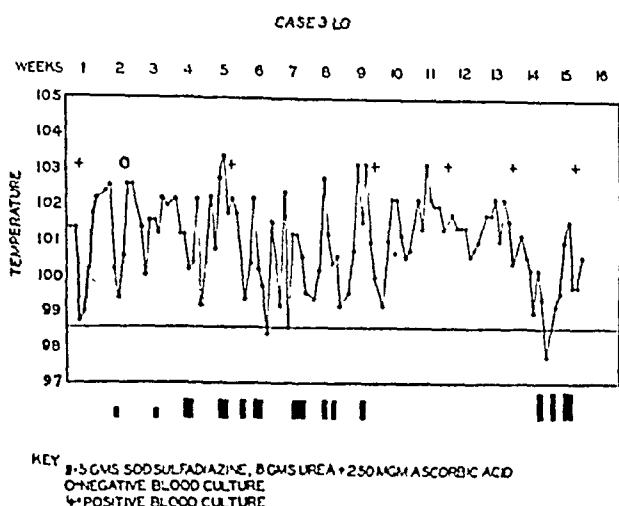


Chart 4.—First fifteen weeks in case 3.

day. The irregular temperature, up to 101 F. during therapy, was attributable in part to the heparin. Repeated blood cultures taken on August 9, 12, 16, 20 and 24 were all sterile.

When the patient continued subfebrile, however, additional treatment was projected. The dosage schedule of penicillin was 100,000 units daily for fourteen days. Collateral heparinization was started with 300 mg. and continued with 200 mg. subcutaneously every other day. On September 1 there was a definite febrile reaction which was due to a grossly contaminated penicillin solution. Although blood cultures taken August 28 and September 3 and 12 were reported sterile, the temperature, which had been normal, became slightly elevated to 100 F. A third course of penicillin and heparin seemed indicated and was begun on September 20, the penicillin dosage being increased to 200,000 units daily intravenously for twenty-eight consecutive days. Satisfactory heparinization was maintained with 200 mg. of heparin incorporated daily with the penicillin except when eliminated temporarily because of an inordinate febrile response or excessive anticoagulant activity.

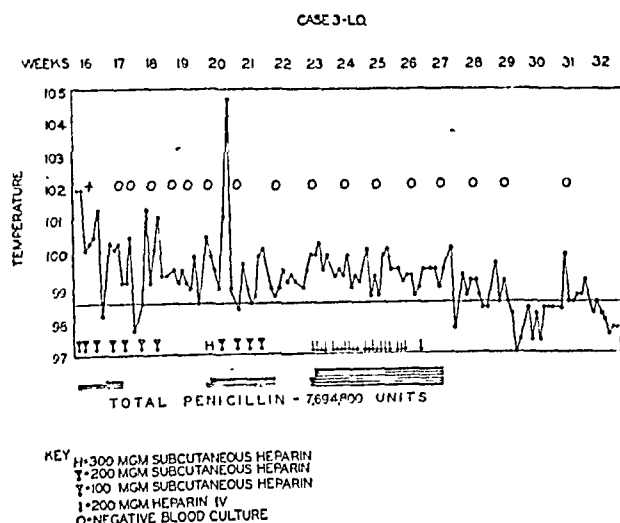


Chart 5.—Sixteenth to thirty-second weeks in case 3.

Dental consultation¹⁰ on October 5 revealed the presence of advanced foci of infection and on October 13 several teeth were removed which were definitely diseased. Gauze packing saturated with penicillin solution, 5,000 units per cubic centimeter, was applied topically. *Streptococcus viridans* was recovered from the dental sockets.

10. The oral surgery on these patients was performed by Dr. M. D. Levin, attending oral surgeon of the Jewish Hospital.

The patient withstood the operative procedure well and all therapy was discontinued on October 19, five days after operation. Blood cultures taken on September 20 and 27, October 4, 12, 13, 18 and 25 and November 1 were all sterile and the temperature continued normal. The patient's weight has increased from a low of 71 pounds (32 Kg.) on July 10 to 92 pounds (42 Kg.). The patient received a total of 7,694,800 Florey units of penicillin in three cycles, 700,000, 1,400,000 and 5,594,800 units respectively. The overall total of heparin employed was 6,700 mg.

CASE 4.—Subacute bacterial endocarditis, *Streptococcus viridans*, three weeks; chronic rheumatic cardiovascular disease, mitral and aortic; post-therapy cerebral embolization with complete recovery; no clinical or laboratory evidence of bacterial activity, three months.

J. N., a man aged 31, was admitted to the Jewish Hospital of Brooklyn on Aug. 17, 1943 because of unexplained fever of three weeks' duration. He had rheumatic fever at the age of 6 and about ten to fifteen years ago noticed dyspnea on exertion, which has persisted to date. Three weeks prior to admission the patient developed pain, redness and tenderness of the toes of his right foot, followed in a week by fever and headache. Two days prior to hospitalization he experienced pain in the left upper quadrant. He suffered a weight loss of 5 pounds (2.3 Kg.).

On entrance his temperature was 98.2 F., pulse 120, respirations 24 and blood pressure 140/0. There were petechiae

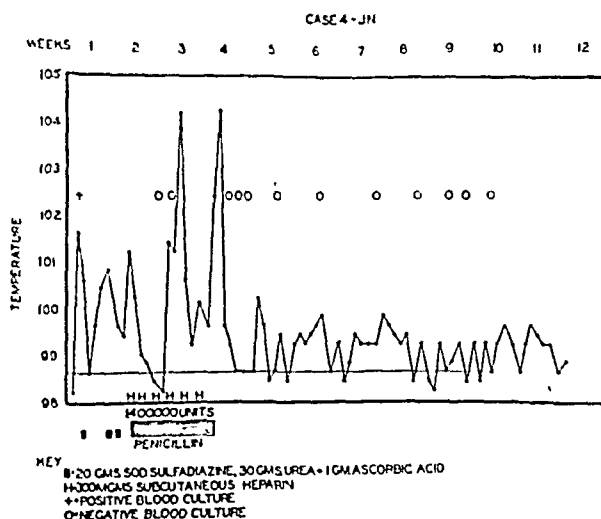


Chart 6.—Course in case 4.

in the buccal mucosa. The heart was enlarged to the anterior axillary line. The first mitral sound was loud and snapping followed by a blowing systolic murmur; the second sound was blurred. There was a to and fro murmur at the aortic area transmitted to the neck, which obliterated the basal sounds. The spleen was palpable 3 fingerbreadths below the costal margin. The clinical impression was rheumatic heart disease with aortic stenosis and insufficiency, mitral insufficiency and subacute bacterial endocarditis with splenic infarction. Blood culture on the day of admission yielded 100 to 200 colonies of *Streptococcus viridans* per plate. On three separate occasions, August 19, 23 and 24, the patient was given intravenously by the gravity method 20 Gm. of sodium sulfadiazine, 30 Gm. of urea and 1 Gm. of ascorbic acid dissolved in 1,500 cc. of distilled water, all of which was wholly ineffectual. Furthermore, he reacted badly to this form of therapy, so that a penicillin-heparin regimen was instituted on August 26. The latter consisted of the daily administration of 100,000 Florey units of penicillin by continuous intravenous drip in conjunction with 300 mg. of heparin subcutaneously on alternate days. The temperature, which was irregularly elevated during the two weeks course of treatment, reached normal two days following its suspension. On September 14 the patient developed a complete left hemiplegia, which cleared entirely within four days. In view of the persistently negative blood cultures it was assumed that the embolization was abacterial. There were no further untoward events until his discharge on November 3, the temperature remained normal, the spleno-

megaly disappeared, the sedimentation rate fell from 95 mm. per hour on September 13 to 14 mm. per hour on October 18, and blood cultures done at practically weekly intervals up to and including October 25 were all sterile. His general condition at discharge was most satisfactory. His weight, which on admission was 145 pounds (66 Kg.), increased to 159 pounds (72 Kg.) on October 31.

As a precautionary measure a dental survey was done on October 19. Several foci of infection were found and the offending teeth removed. Ten thousand units of penicillin dissolved in 2 cc. of saline solution was injected intramuscularly every three hours on the day before, the day of and the day after the oral surgery. The operative site was packed with gauze dipped in 5 cc. of saline solution containing 20,000 units of penicillin. There was no febrile reaction, and the blood culture taken one hour after the dental extraction was sterile. *Streptococcus viridans* was recovered from cultures of the teeth.

In all, the patient received 1,400,000 Florey units of penicillin over a period of fourteen days, during which time he was also given 1,800 mg. of heparin.

CASE 5.—Subacute bacterial endocarditis, *Streptococcus viridans*, four months; chronic rheumatic cardiovascular disease, mitral; no response to intensive sulfonamide and initial course of penicillin-heparin therapy; second twenty-eight day cycle of penicillin-heparin therapy effected sterilization of blood stream and progressive clinical improvement, which has persisted two and a half months; possible penicillin-heparin sensitization.

C. M., a woman aged 22, married, was admitted to the Jewish Hospital of Brooklyn Aug. 17, 1943 because of "bacteria in the blood stream" of three months' duration. She had rheumatic fever at the ages of 6 and 9½ years, after which she was known to have a heart murmur. She was well until May 4, 1943, when she had the "grip," from which she recovered except for weakness and lethargy. About a week later she experienced sudden severe sacral and right lumbar pain, which was followed by ten days of hematuria. She subsequently had left upper quadrant pain which lasted one week. In the seventh week of her illness she was delivered of a 7 month infant under caudal anesthesia. Chills and fever recurred frequently, and blood cultures continued positive despite intensive sulfonamide therapy.

On admission the skin presented a pale lemon yellow pallor with a slight malar flush. There were no petechiae. The spleen was palpable 2 fingerbreadths below the costal margin. The heart was enlarged, and there was a rumbling to and

as the elevated temperature persisted and the blood culture on August 25 was positive. Accordingly penicillin-heparin therapy was started on August 26 with 100,000 units of the former daily by continuous venoclysis for fourteen days and 300 mg. of the latter subcutaneously approximately every other day. The temperature dropped with the onset of this regimen, ranging between 99.2 and 101 F. with the exception of an

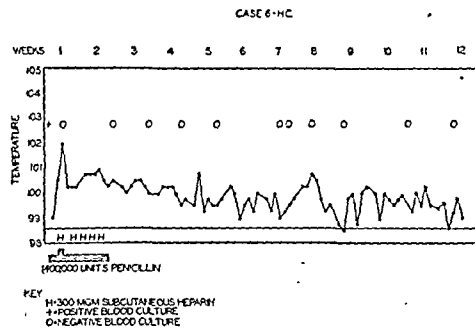


Chart 8.—Course in case 6.

abrupt rise to 104 F. due to air borne contaminants in the penicillin solution. The rise in temperature on the day following suspension of the therapy was attributed to the heparin deposited the preceding day. In view of the continued irregular temperature despite the sterile blood cultures on September 12 and 17 following the positive one of September 10, additional penicillin-heparin therapy was projected. The daily dosage schedule begun on September 18 and continued uninterruptedly for twenty-eight days consisted of 200,000 Florey units of penicillin and 200 mg. of heparin given in combination by continuous intravenous drip. During the therapy the general condition of the patient was good in spite of irregular persistent elevation of temperature. A blood culture taken on October 4 was reported positive for *Enterococcus haemolyticus*, for which no valid explanation was forthcoming because the temperature was normal and the patient appeared exceptionally well. On the twentieth day of therapy, October 12, the temperature suddenly rose to 104 F. An occasional rale was heard at the left base and, on the premise that bronchopneumonia was developing, sulfadiazine 1.5 Gm. was administered every four hours. Blood culture taken this day was sterile, however, and with no further progress in the physical signs the temperature continued spiking daily for four days, attaining a level of 105 F. on the twenty-seventh day of therapy. Penicillin-heparin sensitization was suspected and all treatment stopped, following which the temperature promptly fell to normal within twenty-four hours and remained so thereafter. Blood cultures taken on October 18 and 25 and November 15 were sterile and the sedimentation rate dropped from 67 mm. per hour on September 13 to 12 mm. per hour on November 15. On October 27 two devitalized teeth were removed with the customary prophylactic penicillin treatment (see case 4). The patient was allowed out of bed on November 3 and discharged in excellent condition on November 17. Her weight increased from 105 pounds (48 Kg.) on September 12 to 120 pounds (54 Kg.) on November 14.

This patient received two courses of penicillin-heparin therapy, one of fourteen days' and the other of twenty-eight days' duration; the penicillin requirements were 1,400,000 and 5,250,000 Florey units respectively. The total of heparin employed was 7,600 mg.

CASE 6.—Subacute bacterial endocarditis, *Streptococcus haemolyticus*, three weeks; chronic rheumatic cardiovascular disease, aortic; widespread, almost lethal, embolizations; prompt, dramatic response to penicillin-heparin therapy; progressive clinical improvement and negative blood cultures, three months.

H. C., a woman aged 52, unmarried, was admitted to the Jewish Hospital of Brooklyn on Aug. 28, 1943 for penicillin-heparin therapy. She was transferred for this purpose from the St. Elizabeth Hospital of New York with a diagnosis of streptococcus (hemolytic) bacterial endocarditis engrafted on a chronic rheumatic cardiovascular defect. She entered the St. Elizabeth Hospital on August 7 because of pain in the

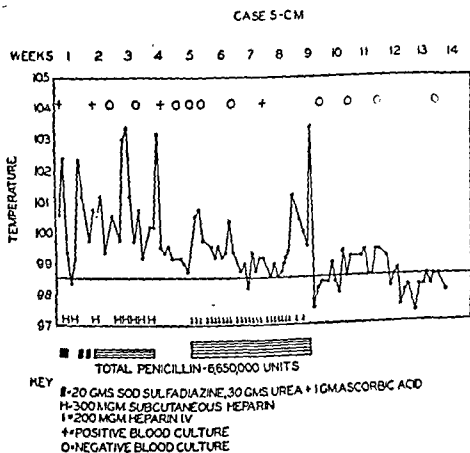


Chart 7.—Course in case 5.

fro murmur at the apex. There was a diastolic murmur at Erb's point. Blood culture taken on the day of admission revealed 250 to 350 colonies of *Streptococcus viridans* per plate. Chemotherapy was given by vein on August 8, 19, 23 and 24 in the form of sodium sulfadiazine 20 Gm., urea 30 Gm. and ascorbic acid 1 Gm. dissolved in 1,000 cc. of distilled water in combination with heparin. The latter was administered subcutaneously in 300 mg. doses. All this proved unavailing,

chest and upper abdomen, sudden weakness, general malaise and chills and fever of one day's duration. She was acutely ill and had two petechiae in the right conjunctival sac. The harsh systolic murmur over the aortic area and the diminished second aortic sound were indicative of an aortic stenotic lesion. The blood pressure was 104/60. *Streptococcus haemolyticus* was isolated from the throat on August 9 and from the blood on August 12. Intensive oral and parenteral sulfonamide therapy had no influence on the course of the infection, the clinical condition becoming progressively more critical with repeated embolizations and hyperpyrexia.

On admission to the Jewish Hospital she was virtually moribund. There was complete motor and sensory aphasia in addition to splinter hemorrhages under the nail beds of the toes and fingers and small ecchymotic areas on the volar surfaces of the fingers. Gallop rhythm was present, with heart sounds of poor quality. Blood culture on August 28 revealed 130 colonies of *Streptococcus haemolyticus* per plate. Penicillin therapy was started immediately, the dosage plan being 100,000 Florey units daily for thirteen days with the exception of the third day, when she received 200,000 units. Heparin, which was withheld pending the outcome of the recent cerebral embolization, was subsequently administered by the subcutaneous method, 300 mg. every other day on five occasions for a total of 1,500 mg. The sterile blood culture on August 31 and the reduction of temperature mirrored the dramatic clinical improvement. Toward the end of the second week of therapy the patient showed signs of pulmonary edema and, in view of the absence of bacterial activity, it was felt that the therapy could safely be interrupted. The patient was digitalized and fluid intake limited. During the succeeding four weeks her condition progressively improved, all embolic phenomena disappeared, the temperature ranged between 99 and 100 F., and blood cultures taken approximately at weekly intervals were sterile.

Occasional complaints of toothache prompted a dental survey at this time, which disclosed several badly diseased teeth. A two stage removal of these foci of infection was done under the customary precautionary penicillin regimen (see case 4).

The sedimentation rate dropped from 30 mm. per hour on September 2 to 14 mm. per hour on October 25 and routine periodic blood cultures were sterile. The clinical improvement continued satisfactorily, the temperature, which hovered between 99.4 and 100.2 F. for several weeks finally became normal, and the patient was discharged in good condition on November 17.

CASE 7.—Subacute bacterial endocarditis. *Streptococcus viridans*, ten weeks; chronic rheumatic cardiovascular disease, mitral; repeated, cyclic, massive sulfonamide therapy unavailing; satisfactory response to a two weeks course of penicillin-heparin therapy; progressive clinical improvement and complete absence of bacterial activity over two months; post-therapy, prophylactic tonsillectomy.

I. S., a man aged 35, was admitted to the Jewish Hospital of Brooklyn on Aug. 8, 1943 with complaints of chills and fever of ten weeks' duration. On the tenth day of his illness he had sudden, sharp, severe left upper quadrant pain, which receded after twenty-four hours. He entered another hospital, where a provisional diagnosis of typhoid was made. He was told that he had a large spleen but that all laboratory tests, including blood cultures, had been negative. He remained in the hospital for three weeks, the last ten days of which were afebrile.

Two weeks before admission to the Jewish Hospital the patient began to have chills and fever with daily spiking of temperature. His past history revealed an episode of "rheumatism for two months" at the age of 5. On entrance the temperature was 100.6 F., pulse 120, respirations 30 and blood pressure 120/80. The skin was pale with slight café au lait tint. There was a systolic blowing murmur at the apex, and the spleen was palpable 2 fingerbreadths below the costal margin. Blood culture done the day of admission revealed 40 colonies of *Streptococcus viridans* per cubic centimeter and confirmed the clinical diagnosis of subacute bacterial endocarditis. On August 11 combined sulfonamide-heparin therapy was started. The chemotherapy was of the massive, cyclic variety and consisted of 20 to 40 Gm. of sodium sulfadiazine,

30 to 60 Gm. of Zeitz filtered urea and 1 to 2 Gm. of ascorbic acid given on two successive days at approximately weekly intervals. Heparinization was accomplished with 300 mg. of the drug given subcutaneously approximately every other day. After the second cycle of therapy the blood culture taken during a post-transfusional febrile reaction yielded 7 to 12 colonies of *Streptococcus haemolyticus* per plate. The fifth and sixth cycles of chemotherapy (60 Gm. of sodium sulfadiazine) were started on September 10 and 17 without effect, as the blood cultures taken on September 14, 15 and 20 were all variously positive for *Streptococcus viridans*. It was evident at this point that the organisms were sulfonamide resistant and that massive chemotherapy had been futile despite levels up to 68.7 mg. per hundred cubic centimeters total and 59.0 mg. per hundred cubic centimeters free sulfadiazine.

On September 26 a fourteen day course of penicillin-heparin was started, the daily dosage consisting of about 200,000 Florey units of penicillin and 200 mg. of heparin dissolved in 1,500 cc. of isotonic solution of sodium chloride and given by continuous intravenous drip. The total penicillin administered was 3,203,200 Florey units, and the overall total of heparin was 6,700 mg. The temperature, which was irregularly lower during therapy, promptly dropped to normal following cessation of therapy on October 10 and has remained so to date.

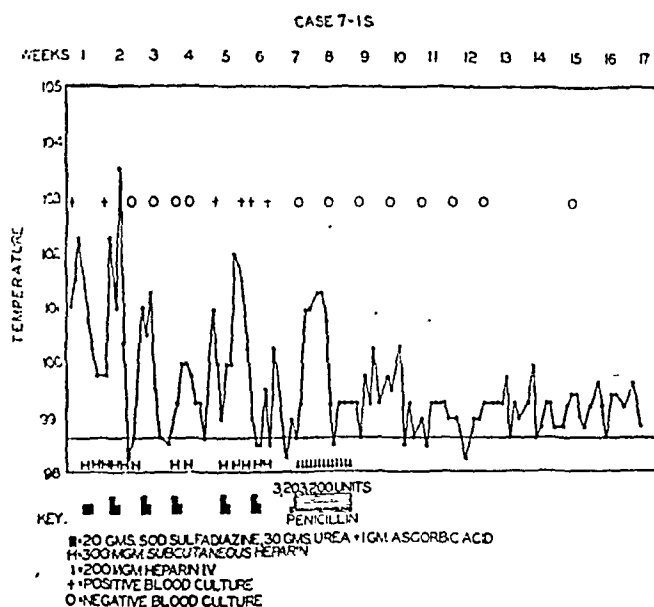


Chart 9.—Course in case 7.

The sedimentation rate receded from 100 mm. per hour on August 9 to 24 mm. per hour on November 15, and repeated blood cultures have been sterile. The weight has increased from 143 pounds (65 Kg.) on September 12 to 153 pounds (69 Kg.) on November 21. The patient is in excellent condition and is awaiting discharge following the removal on November 22 of frankly infected tonsils, from which pus could be extruded. The prophylactic tonsillectomy was done under the customary, precautionary penicillin regimen (see case 4). *Streptococcus viridans* was the predominant organism in cultures of the removed tonsils.

SUMMARY

1. Seven consecutive patients with subacute bacterial endocarditis have been treated by a method which combines the uses of penicillin and heparin. Further observation will be required to determine the permanence of results, but the immediate effects suggest uniformly successful sterilization of the blood and relief of clinical manifestations.

2. Penicillin has been given in requisite dosage by the method of the continuous intravenous drip. One patient, however, also received the drug intramuscularly.

3. Heparin has been deposited subcutaneously in most instances but was occasionally given in the intravenous infusion.

4. There has been no significant toxicity as the direct result of therapy. In point of fact, treatment was well tolerated and each of the patients exhibited striking well-being during and after the active period of treatment.

5. In a few of the patients the efficacy of the therapy may have been enhanced by the preliminary use of sulfonamide.

6. Post-therapy management included the removal of possible foci in the teeth and nasopharynx. These surgical procedures were accompanied by additional prophylactic chemotherapy with penicillin.

COMBINED HEPARIN AND CHEMOTHERAPY IN SUBACUTE BACTERIAL ENDOCARDITIS

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CHICAGO
AND

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MEDICAL CORPS, ARMY OF THE UNITED STATES

It has been shown previously by experimental work from this department¹ that the cause for the persistence of infection of *Streptococcus viridans* in a valvular vegetation is due to (a) the relative avascularity of the valve leaflets, (b) the presence of a fibrin-platelet barrier which interferes with the entrance of white blood cells and hinders the diffusion into the lesion of bacteriostatic and bactericidal agents present in the blood stream and (c) the fibrin constantly being added, which offers an excellent medium for the growth of these bacteria. On this basis it was thought that the prevention of further deposition of fibrin might be achieved with heparin, thereby permitting the vegetation to heal. The first case of subacute bacterial endocarditis treated with heparin was reported from this department.² Simultaneously Kelson and White³ reported their experience with 7 patients treated with heparin combined with sulfonamide therapy.

Since then combined heparin and sulfonamide therapy has been tried by many. Sixty-seven patients so managed have been tabulated and thoughtfully reviewed by McLean, Meyer and Griffith.⁴ Since then several additional cases have been reported.⁵ The latest tabulation⁶ lists 109 such cases. In this report we are placing on record 4 additional cases treated by us since publication of our original report. In 2 of these, intensive arsenotherapy was combined with the heparin and sulfonamide therapy because of the favorable report of Osgood.⁶

Aided by the A. D. Nast Fund for Cardiovascular Research. Drs. W. W. Hamburger (deceased), Sidney Strauss and Morris Lev gave valuable service as clinical consultants.

From the Cardiovascular Department, Michael Reese Hospital. The department is supported in part by a grant from the Michael Reese Research Foundation.

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REPORT OF CASES

CASE 1.—F. M., a white woman aged 34, who was admitted to another hospital during the first week in January 1941 because of a three weeks history of fever, malaise, chills and joint pains which developed several weeks after the patient had two teeth extracted in the preceding November, then developed headache, dyspnea on slight exertion, orthopnea and ankle edema. She had had rheumatic polyarthritides at the age of 9, with evidence of heart involvement sufficiently severe to compel her to restrict her activities during her adolescence and in her twenties. She took digitalis on several occasions.

At the previous hospital the diagnosis of subacute bacterial endocarditis was based on the presence of rheumatic heart disease, petechiae, fever, leukocytosis and seven positive blood cultures showing *Streptococcus viridans*. While there she received sulfathiazole orally for about two months and heparin for one day (but this did not prolong her clotting time). The chemotherapy had to be discontinued because of persistent nausea. No clinical improvement was observed to result from the chemotherapy. On admission to Michael Reese Hospital on April 4, 1941 she appeared well nourished and well developed, with a café au lait complexion. The heart was enlarged, and murmurs characteristic of mitral stenosis and insufficiency and of aortic insufficiency were found. She had a Corrigan pulse, her blood pressure was 134/52 mm. of mercury and she had frequent premature systoles. The spleen was not palpable, and she had Janeway nodes on the soles of her feet. Eyeground examination showed blurred optic fundi and retinal petechiae.

The temperature was 102 F. by rectum, the pulse rate 116 per minute and the respiratory rate 22 per minute. The total white cell count was 15,600 with a shift to the left. The red blood cell count was 3,200,000 with 60 per cent hemoglobin. Two blood cultures were positive for *Streptococcus viridans*. There were 4 to 5 red blood cells per high power field in the urine sediment. The electrocardiogram revealed a sinus tachycardia, left ventricular preponderance and auricular premature systoles and was definitely abnormal. In the teleroentgenogram, the heart was bilaterally enlarged and the left auricle was dilated. During the patient's stay in the hospital petechiae, some white centered, appeared in the conjunctiva, on the hand and on the soft palate. Osler nodes of the fingers also were found.

The patient was started on sulfapyridine on April 14 but developed nausea on the same day and accordingly it was stopped. She was given heparin⁷ for seven days, from April 16 to 23. An average of 30 to 40 cc. per day was given intravenously dissolved in 2 liters of isotonic solution of sodium chloride. The total amount of heparin used was 262.5 cc. The clotting time was prolonged from 43½ minutes to from 12 to 25 minutes with a maximum of 36 minutes. The heparin was stopped on April 23 because the patient developed signs of cerebral hemorrhage. The patient died the next day. During heparinization her temperature fluctuated between 101 and 102 F. and she showed no clinical improvement.

The salient findings at necropsy were a subacute bacterial endocarditis on the aortic and mitral valves (superimposed on an old rheumatic valvulitis) extending to the left auricle, an acute myocarditis with small infarcts and a recent subarachnoid hemorrhage with hemorrhage into the left temporal lobe.

CASE 2.—B. S., a white woman, aged 27, admitted to Michael Reese Hospital on Dec. 4, 1940, complained of pain in the lower left leg. This first occurred in October and was followed three weeks later by a second similar episode lasting a week and accompanied by a chill. A local physician detected a double murmur over the apex and fever and informed the patient that she had acute rheumatic fever. She had had palpitation and orthopnea in the past one and one-half years and occasional ankle edema since 1936 and had lost 16 pounds (7.3 Kg.) preceding admission. There was no "rheumatic" history. In the past she had had measles, and, three years before admission, scarlet fever without any known sequelae. In 1938 she was diagnosed as having a toxic diffuse goiter and improved on strong solution of iodine (Lugol's solution).

7. Liquaemin, supplied for this and the other patients by E. R. Organon, Inc.

On admission the patient was pale, thin and ill looking with a temperature of 101.6 F. and she had a suspicious petechia on the right buccal mucosa. The heart was definitely enlarged, the apical impulse being close to the anterior axillary line in the sixth intercostal space. The heart sounds were of good quality. There was a fine systolic thrill at the apex, an apical systolic murmur and a questionable apical diastolic murmur. The heart rate was 100 per minute and the blood pressure 90/68 mm. of mercury. The spleen was palpable one finger's breadth below the costal margin and not tender. There were suspicious petechiae on the left leg, and early clubbing of the fingers was present.

The red blood cell count was 3,800,000 with 70 per cent hemoglobin, and the white blood cell count was 7,600. The urine was normal. Four blood cultures were positive for alpha hemolytic streptococcus; however, two subsequent blood cultures also revealed *Streptococcus viridans*. A teleroentgenogram showed the heart to be within average normal limits, and the left auricle was not dilated.

During the patient's course, petechiae in the eyegrounds and hard palate developed. Many Osler and Janeway nodes also appeared.

She was started on oral sulfanilamide on Dec. 24, 1940 and the blood level was maintained between 8 and 11 mg. per hundred cubic centimeters. This was stopped on Feb. 5, 1941 because of a toxic dermatitis. Sulfathiazole (15 grains [1 Gm.] alternating with 22½ grains [1.45 Gm.] every four hours orally) was then substituted and continued to April 4, but the maximum blood level attained was only 3.5 mg. per hundred cubic centimeters. During the five weeks on sulfanilamide therapy and the two months on sulfathiazole the blood cultures remained positive. On January 14 the patient was given heparin about cc. per day intravenously on the average. This was administered dissolved in 2 liters of isotonic dextrose-sodium chloride solution. Heparin was used without interruption continuously day and night for six weeks. The normal clotting time of six to seven minutes was kept prolonged at 20 to 25 minutes on the average with peaks up to 2 to 2½ hours. The total heparin used over the six weeks was 1,260 cc.

After two weeks of heparinization she was given massive arsenotherapy intravenously for four days. On the first day she received 120 mg. of mapharsen dissolved in 2 liters of isotonic solution of sodium chloride and on the other three days 240 mg. per day similarly diluted. A total of 840 mg. of mapharsen was given. On the fifth day the arsenotherapy was discontinued because of a toxic hepatitis from which the patient recovered. Heparin administration was continued during the arsenotherapy. The average temperature prior to arsenic therapy was about 100.6 F., but during it the temperature remained below 99 F. and at no other time in the patient's course did it approach normal levels.

This patient tolerated the protracted course of heparin very well but there was no evidence that it or the chemotherapy led to improvement clinically or had any crucial influence on her illness. Her course after therapy was stopped was progressively downhill. Crops of petechiae appeared in April; paroxysmal auricular fibrillation occurred in May associated with right hemiparesis which improved. She died on June 19 after seven months of hospitalization. Unfortunately permission could not be secured for a necropsy.

CASE 3.—E. G., a white woman aged 25, admitted to Michael Reese Hospital on Aug. 7, 1941, complained chiefly of paralysis of the right side of the body (without unconsciousness), which developed suddenly during a meal a day before admission. Two weeks prior to this she had had transient episodes of loss of speech and a retraction of the left corner of her mouth; during these episodes she had felt drowsy. She also complained of feeling weak and feverish and of pains and "red spots" at the tips of her fingers over the preceding eight weeks. She had lost 25 pounds (11 Kg.) in this same period. At the age of 9 she had chorea and since then had known about her rheumatic heart affliction. In 1940 she successfully bore a child and had an appendectomy.

On admission the patient was thin, anemic and acutely ill in appearance, her temperature was 100.4 F. and her pulse rate 110 beats per minute. The heart was slightly enlarged and the

murmurs of mitral insufficiency and stenosis were present, as well as a presystolic apical thrill. Her blood pressure was 120/80 mm. of mercury. The spleen was palpable one finger's breadth below the costal margin but was not tender. There were neurologic signs of previous cerebral embolism, but no paralysis or paresis was found.

The red blood cell count was 4,000,000, with 80 per cent hemoglobin. The white blood cell count was 11,000, with a shift to the left. The urine was normal. The stool contained occult blood. The electrocardiogram was normal. The teleroentgenogram revealed the configuration expected with mitral stenosis and insufficiency. Five blood cultures were positive for *Streptococcus viridans*.

The patient received sulfapyridine by mouth from August 14 to 22, the average blood level attained being 9.1 mg. per hundred cubic centimeters. This had to be discontinued because of severe nausea and vomiting. Sulfathiazole was later substituted for twenty-one days (September 5 to 26) and the average blood level was maintained at 2.5 to 4.0 mg. per hundred cubic centimeters.

Heparin was started September 9 and stopped September 17. The quantity used per day varied from 20 to 60 cc. intravenously, the average being 30 cc. This was administered dissolved in 2 liters of isotonic solution of sodium chloride. The blood clotting time was prolonged from a normal of 7 minutes to from 12 to 36 minutes, the average being about 25 minutes. Heparin was discontinued because of the suspicion of cerebral hemorrhage manifested by numbness and difficulty of movement of the left arm and leg. However, three days after stoppage of heparin administration sensation and motion of the affected extremities had returned. The blood cultures remained positive during heparinization.

In November the patient received oral sulfadiazine for twenty-six days (the blood level ranged from 5.9 to 13.9 mg. per hundred cubic centimeters) and an arsenical preparation, Solar-sen, 1 cc. per day intravenously for seven days. On November 26 she was given a total of 96 mg. of mapharsen by vein dissolved in 2 liters of isotonic solution of sodium chloride, but this was discontinued because of toxic symptoms. During all this therapy there was no evidence of clinical improvement. On December 1 the patient left the hospital against advice and returned nineteen days later in a state of disorientation with another recent hemiplegia. She died on December 30, five months after her first admission.

Necropsy revealed an old rheumatic endocarditis of the mitral valve with a superimposed ulcerating and vegetative subacute bacterial endocarditis with extension to the auricular endocardium. There were embolic manifestations in the skin, spleen, kidney, brain, coronary vessels and gastrointestinal tract. Microscopically the mitral valve showed granulation tissue, fibrin and bacteria engrafted on a fibrotic valve. The immediate cause of death was an extensive bronchopneumonia.

CASE 4.—G. G., a white girl aged 16 years, was admitted to Michael Reese Hospital on May 31, 1941 because of a feeling of weakness, night sweats and a fever of twenty-four days' duration. She also had had mild palpitation and dyspnea after excitement on moderate exercise for the previous six months. She had had rheumatic fever and rheumatic heart involvement at the age of 7 with three exacerbations.

On physical examination the patient appeared pale, thin and cyanotic. There was a systolic thrill in the carotid arteries. The cardiac apex was in the fifth intercostal space at the anterior axillary line. There was a systolic thrill over the aortic area. The murmurs of mitral and aortic insufficiency and of mitral stenosis were present. The pulse was of the Corrigan type, the blood pressure 110/0 mm. of mercury, and a pistol shot murmur was audible over the femoral arteries. The splenic edge could be palpated at the costal margin but was not tender. Early clubbing of the fingers was present.

The temperature was 100.4 F. The heart rate was 86 beats per minute. The red blood cell count was 3,640,000, with 65 per cent hemoglobin. The white blood cell count was 12,500. The urine was negative. The sedimentation rate was 33 mm. per hour. The electrocardiogram was definitely abnormal. The teleroentgenogram revealed an enlarged heart with the configuration expected with mitral and aortic valve involvement;

the left auricle was dilated. Three blood cultures were positive for *Streptococcus viridans*.

Sulfathiazole was given from June 14 to July 1 in doses of 15 grains (1 Gm.) every four hours. Sulfapyridine was begun on July 12 and continued until the 17th, 15 grains being given by rectum every four hours dissolved in 50 cc. of water. The blood level on the 16th was 1.7 mg. per hundred cubic centimeters. Between July 22 and 25 the drug was administered in doses of 2 to 5 Gm. intravenously. Nausea and vomiting accompanied each period of sulfonamide administration.

Heparin was given between July 22 and 26; 15 to 25 cc. was given intravenously per day, the total being 105 cc. The heparin was administered dissolved in 2 liters of isotonic solution of sodium chloride. Heparin prolonged the clotting time from 4 minutes to from 11 to 57 minutes, the average being 26 minutes. All therapy ceased on the 26th, when the patient left the hospital against advice and track was lost of her. The therapy appeared to have had no beneficial effect clinically, the fever persisting and the blood cultures remaining positive.

COMMENT

All 4 patients were young women suffering from *Streptococcus viridans* endocarditis of varying duration before therapy was started. No benefit appeared to have been derived from the therapy given in any of these cases aside from the drop in temperature to normal levels in case 2 during the four days of massive arsenotherapy with mapharsen. Our experience that massive arsenotherapy may temporarily relieve the fever is similar to that reported by Druckman⁸ in a patient who received a total of 3.6 Gm. of neoarsphenamine over four days. However, this was heroic therapy and had to be stopped in both of our cases because a toxic hepatitis developed. Furthermore, the drop in temperature was not seen in the other case (case 4) in which we employed arsenotherapy. The sulfonamides not only were not beneficial in our cases but also had to be stopped because of toxic symptoms on several occasions in all our cases except when the blood levels were too low. The addition of heparin given for five, seven and nine days in 3 of our cases and for six weeks in case 2 did not lead to clinical improvement in any of these cases. In fact, in case 1 it resulted in a fatal cerebral hemorrhage, and it may have been responsible for a nonfatal milder episode of a similar character in case 3.

Case 2 represents the longest period of continuous heparinization recorded in the literature and, while no benefits were obtained clinically, no harm resulted. The possibility that this prolonged heparin treatment may have favored at least partial healing of the vegetations and contributed to prolonging the patient's life could not be determined, since necropsy examination was not permitted.

Our original idea,¹ and the same suggestion was also made by McLean and his associates,⁴ was that the efficacy of heparin could be best studied by administering it alone, as the blood in this disease is known to have a high antibody titer, the problem being one of sterilizing the bacterial vegetations rather than sterilizing the blood stream. In our case¹ and in the 2 cases reported by Leach and his co-workers⁹ heparin alone was ineffective. Other similar reports have appeared.¹⁰

Combined therapy was tried in the present study as it doubtless was by others in order to seek out

a combination, simple or complex, which would act on the vegetative lesion and lead to statistically significant clinical recoveries. Recently assays of the literature on the therapy of subacute bacterial endocarditis have been assembled¹¹ which at first sight tend to suggest that sulfonamide therapy, especially when combined with heparin or hyperthermia, has led to a somewhat greater percentage recovery than occurs spontaneously or with nonspecific therapy. Thus, in a summary of the literature it was reported by Smith, Sauls and Stone¹¹ that of 634 untreated or nonspecifically treated patients 1 per cent recovered, while the rate of recovery was 6 per cent in 198 patients treated with sulfonamides, 11.5 per cent in 43 patients treated with sulfonamides and heparin and 18 per cent in 46 patients treated with sulfonamides and physical hyperthermia or intravenous typhoid. Later, Lichtman⁵ assembled a larger series from the literature and noted 1 per cent recoveries in 2,956 untreated or nonspecifically treated cases, as against 4 per cent recoveries in 489 cases treated with sulfonamides, 6.5 per cent in 109 cases treated with sulfonamides and heparin and 10 per cent in 106 cases treated with sulfonamides plus physical hyperthermia or intravenous typhoid. These apparently favorable records, however, are no more than suggestive, since the series are small and may not be statistically significant. It may be significant that the percentage of recoveries in the later report is lower than in the earlier one on a smaller series. Furthermore, it is obvious that negative results are less apt to be reported than positive ones. It is also easy to confuse a long spontaneous remission which occurs in this disease with recovery attributable to the therapy used. The possibility also exists that, in some of the cases reported in the literature as subacute bacterial endocarditis, *Streptococcus viridans* was simply the organism causing a septicemia without having led to subacute bacterial endocarditis. Such a circumstance has been reported.¹² A final judgment as to which, if any, of these plans of therapy is efficacious must therefore await future analysis, and it is proper when utilizing such therapy to consider it still in the experimental stage.

If the use of sulfonamide therapy, either alone or combined with heparin, is based on the hope that the agent may penetrate into the vegetation and there check the continued growth of the organism, thereby permitting the vegetation to heal, this healing effect should be demonstrable on postmortem examination. While accelerated healing has been reported in a few treated cases post mortem,¹³ in most of them,¹¹ including the 2 of our present series in which necropsies were done, there is little effect in the valves which could be ascribed to specific therapy rather than to the usual tendency to healing typical of this disease. As Leach and his co-workers⁹ state, "Postmortem examination in several cases revealed little effect on the vegetation from either the chemotherapy or the heparin. . . . It was the rule to find the vegetations swarming with organisms in spite of high antemortem blood levels of sulfonamide." Kelson⁹ alone states that an unusual degree of healing occurs.

11. Smith, C.; Sauls, H. C., and Stone, C. F.: Subacute Bacterial Endocarditis Due to *Streptococcus Viridans*, *J. A. M. A.* **119**: 475 (June 6) 1942. Lichtman.⁵

12. Moore, G. B., Jr., and Tannenbaum, A. J.: *Streptococcus Viridans* Septicemia: Cure with Sulfapyridine, *J. A. M. A.* **118**: 372 (Jan. 31) 1942. Nye, R. X.: *Streptococcus Viridans* Septicemia, *End.* **118**: 547 (March 14) 1942.

13. Kelson and White.¹ McLean, Meyer and Griffith.⁴ Friedman, Hamburger and Katz.² McLean, Meyer and Griffith.⁴ Leach, Faulkner, Duncan, McGinn, Porter and White.⁹ Fletcher.¹⁰ Witts.¹⁰

8. Druckman, J. S.: Case of Subacute Bacterial Endocarditis with Apparent Cure, *J. A. M. A.* **117**: 101 (July 12) 1941.
9. Leach, C. E.; Faulkner, J. M.; Duncan, C. N.; McGinn, Sylvester; Porter, R. R., and White, P. D.: Chemotherapy and Heparin in Subacute Bacterial Endocarditis, *J. A. M. A.* **117**: 1345 (Oct. 18) 1941; (comment by S. R. Kelson, p. 1349).
10. Fletcher, C. M.: *Lancet* **1**: 444, 1941. Witts, L. J.: *Brit. M. J.* **1**: 484, 1940. Dockeray, G. C., and Kawerau, E., *ibid.* **2**: 703, 1940.

One risk in heparin therapy is the high incidence of bleeding. Of the 67 cases tabulated from the literature by McLean and his associates¹ which came to necropsy 11 showed evidence of hemorrhage, usually cerebral, in 9 of which death occurred. Renal hemorrhage has also been reported. Two of our 4 cases, as well as the first case previously reported by us,¹ also showed clinical and/or necropsy evidence of cerebral hemorrhage. Of 22 patients treated with heparin and sulfonamides, 8 died of cerebral hemorrhage during the time heparin was given. Several other authors¹⁵ have commented on this harmful sequel to administering heparin in this disease. Only Kelson¹⁶ appears to have been fortunate in avoiding the hazards of heparin, since he states that cerebral bleeding occurred in none of his cases. There are in addition a number of difficulties in the control and management of patients during heparinization. Thus our patient receiving heparin for six weeks required constant care and attention in order to be sure of needle placement and to keep the clotting time within set limits.

It is the consensus, to which we add our own experience, that the disadvantages of heparin, used alone or in conjunction with chemotherapy, in the treatment of subacute bacterial endocarditis heavily outweigh its advantages. Friedman,¹⁶ who participated in the development of the idea of the use of heparin in this department, subsequently concluded that the further use of heparin should be abandoned in subacute bacterial endocarditis. This view has been voiced by others,¹⁷ after surveying the reports in the literature and our own further experience, we take this opportunity to go on record as concurring in this opinion.

The therapeutic value of arsenotherapy in subacute bacterial endocarditis has recently been advanced by Osgood,⁶ who reported 14 per cent apparent recoveries in 70 cases. Lippmann¹⁸ has reported a case with apparent recovery following the use of sulfonamide combined with arsenotherapy (Solarsen). It was these reports that stimulated us to try out the effects of arsenotherapy in combination with heparin and sulfonamides. Our experience in 2 cases were negative, so that we feel that arsenical therapy also is still in the experimental stage. If used in intensive doses its administration must be carefully watched because of the hazard of toxic reactions.

SUMMARY

In 4 cases of combined heparin and chemotherapy, either sulfonamides or sulfonamides and intensive arsenotherapy in the treatment of subacute bacterial endocarditis due to *Streptococcus viridans*, the results were entirely negative, no evidence of clinical recovery being seen. In 2 of the 4 cases evidence of cerebral hemorrhage during heparin administration was found, making a total of 3 out of 5 cases studied by us.

In 1 of our cases it was possible to administer fairly large quantities of heparin continuously intravenously for six weeks without ill effects. This is the longest period of such administration on record.

In view of this experience and that of others reported in the literature, it is concluded that the further use of heparin in subacute bacterial endocarditis should be abandoned.

CHEMOTHERAPY IN OPHTHALMOLOGY

PARKER HEATH, M.D.

DETROIT

Medical science in the past few years has developed chemical compounds high in bacteriostatic effect and low in local irritant or general harmful reaction. The sulfonamides are widely used in this capacity, and other compounds made from bacillary or mold extracts offer high therapeutic promise. The rapidly expanding use of chemotherapy travels with more knowledge of how these agents work and why they fail. Selection of the substance used becomes more important as physicians learn under clinical conditions the rates of absorption and elimination, the solubility and effective concentrations, the toxicity and side reactions—in short, the specificity of each compound. When several agents are equally effective in meeting a clinical problem, low toxicity and freedom from sensitization reactions or late harmful effects should govern selection. Rapid and known specific effects may outweigh in value the factor of low toxicity. From the comparative safety of low dosage some are led to employ the sulfonamides non-specifically. This is not good practice in general because there are usually enough directives for specificity. Also there are possibilities of establishing early sensitivity, and late unknown reactions may follow tampering with immunity processes.

Toxic side effects are not uncommon with the widely used sulfonamides. They relate chiefly to the hemopoietic system and the urinary tract. The ocular field may show edema and dermatitis of the eyelid, conjunctivitis, clouding of the media and orbital edema, and the second nerve may show reaction. The skin of the eyelids and face may present an appearance of a dermatitis from external sources, or vesiculation, or deep edema and cellulitis or both—sometimes not unlike erysipelas. In some instances effective concentrations of a sulfonamide may be maintained and sensitivity corrected by switching to another compound. In other instances the sensitivity seems to be related to the sulfonamide ring; it then becomes necessary to employ less related substances, as the extracts of molds or bacteria. Established effective methods of therapy need not be discarded in favor of something new. With the right to prescribe the medicament should go the responsibility of continued study of the patient. The ambulatory patient should use sulfonamides only with enforceable restrictions and checks. The daily excretion of urine should be 1,500 cc. or more. With extra fluid intake and added sodium bicarbonate, urinary complications are reduced. When the rare complication anuria develops, catheterization and flushing out of the ureter should follow stoppage of the drug. Differential blood counts are necessary. "Blood levels at least every two days" is a good rule.

The effective dosages and concentrations are variable with the same drug in different infections and patients. To be more fully worked out are combinations of the sulfonamides with other substances—with urea to increase solubility and concentration, with pus and paraaminobenzoic acid in excess to reduce inhibitors, with zinc compounds to augment the effect and permit lowered concentrations, with vasoconstrictor to produce less capillary congestion and local absorption. Drug fastness is an important problem for solution. Much

15. Waitzkin, L.; Smith, R. H., and Martin, W. B.: *Ann. Int. Med.* 16: 356, 1942. Fletcher.¹⁰ Smith, Sauls and Stone.¹¹

16. Friedman, Meyer: Use of Sulfanilamide and Sulfapyridine in Therapy of Subacute Bacterial Endocarditis, *Arch. Int. Med.* 67: 921 (May) 1941.

17. Blumer, G.: *West. J. Surg.* 49: 406, 1941. Waitzkin, Smith and Martin.¹⁵ Smith, Sauls and Stone.¹¹

18. Lippmann, K.: *New York State J. Med.* 40: 524, 1940.

remains to be learned about enlarging the scope of these substances by methods common and unusual in pharmacologic research.

SPECIFIC SUGGESTIONS

Inclusion Blepharitis.—Sulfathiazole is used. The oral dosage is one-third grain (0.022 Gm.) per pound daily in divided doses. This dosage is discontinued after the fourth to seventh day. Local treatment consists of antiseptic washes and the use of 5 per cent sulfathiazole ointment at night.

Gonorrheal Ophthalmia or Gonorrheal Conjunctivitis.—These conditions are effectively treated by oral doses of sulfapyridine, sulfathiazole or sulfanilamide. For an adult the initial oral dose is 3 to 4 Gm.; subsequently 1 Gm. is given every four hours. For a child the dosage is one-third grain (0.022 Gm.) per pound of body weight in divided doses daily; the initial and second doses may be larger to hasten the effect. Local treatment is in order with an ice compress for much edema (occasionally canthotomy), antiseptic irrigations, an ointment containing a sulfonamide compound, atropine if indicated and a conjunctival flap for ulceration and imminent perforation. The powdered drug is used locally with success by some. The use of sulfonamides should be continued until smears are negative for two days.

Hemolytic Staphylococcus Conjunctivitis.—The general treatment consists in the administration of staphylococcus toxoid, the local treatment in the application of a zinc ointment containing sulfathiazole 3.0 per cent and an ointment containing sulfadiazine or sulfathiazole 5.0 per cent twice daily. The conjunctiva should be washed with an antiseptic solution four to six times a day.

Pneumococcal Conjunctivitis.—Tyrothricin (except Friedländer's type) 30 mg. per hundred cubic centimeters is dropped freely into the eyes four to six times daily. For pneumokeratitis and ulcer the same dosage of tyrothricin is used with oral administration of sulfapyridine or sulfadiazine, 2 to 4 Gm., initial dose, followed by 1 Gm. every four hours around the clock. Locally one may use atropine, the cautery and, if indicated, paracentesis and delimiting keratectomy. Foreign protein and typhoid-paratyphoid vaccine have proved value.

Traumatic Injury.—The eye and its parts have a rich blood supply, usually favorable to repair. Foreign matter is removed, and minimal débridement is done. Free local application of a sulfonamide compound or of a preparation of Penicillium when available lessens the possibility of infection and permits more complete early repair. General chemotherapy is necessary for severe ocular lacerations and penetrating wounds of the globe, especially if infection is suspected.

Epidemic Keratoconjunctivitis—Shipyard Fever.—The most favorable results to date have followed local use of tyrothricin 30 mg. per hundred cubic centimeters four to six times daily. Few favorable results have followed the use of zinc ointment containing sulfathiazole 3.0 per cent and other sulfonamide compounds in combination with other drugs. Convalescent serum has not been consistently useful.

Specific Keratitis and Ulcer Due to Bacillus Pyocyaneus.—This requires early treatment (a matter of hours) with sulfapyridine or sulfadiazine; the initial dose is 4 to 5 Gm.; it is followed in one hour by 2 Gm., and thereafter by 1 Gm. every four hours around the

clock. The treatment is continued for ten to twenty-one days, the dosage being regulated by blood levels and the clinical course.

Dendritic Keratitis.—Local and oral use of the sulfonamides has not been of much value. Local application of tyrothricin 30 mg. per hundred cubic centimeters with repeated pasteurization by cautery (daily or on alternating days) has led to the most rapid cure.

Blepharitis.—Blepharitis and that form of punctate keratitis associated with chronic conjunctivitis (usually caused by a staphylococcus) are sometimes cured by using sulfadiazine or sulfathiazole ointment three to six times a day. Tyrothricin is helpful (20 mg. per hundred cubic centimeters). The compound neosynephrine sulfathiazolate 3.0 per cent has relieved some obstinate cases.

Orbital Abscess.—Sulfadiazine, sulfapyridine or sulfathiazole is used. The initial oral dose for adults is 2 to 5 Gm., which is followed by 1 Gm. every four hours around the clock. For children the doses are reduced proportionately. Other measures, such as the use of hot wet dressings and drainage, must be considered.

Thrombosis of the Cavernous Sinus.—Hope of cure is offered by a high dosage of sulfadiazine. A rather high blood level should be maintained for three to six weeks. Treatment must be prolonged to prevent relapses.

Uveitis.—The eye with acute uveitis is helped in some cases by the oral use of sulfonamide drugs. Indiscriminate use of these drugs is to be avoided. Sulfadiazine and sulfapyridine have proved about equally effective. When the source of the uveitis is related to the gastrointestinal tract, sulfadiazine and sulfapyridine offer help. The key to successful treatment is to attack the causative agents. In a moderate degree of iritis recovery is sometimes hastened by the use of sulfonamide compounds. Choroiditis is least affected by such treatment. Sympathetic uveitis or ophthalmia so far has been unevenly affected either by high dosage for short periods or low dosage over long intervals. This ocular catastrophe justifies continued clinical investigation to determine the value of its treatment by chemotherapeutic agents.

Trachoma.—The oral dosage of sulfanilamide is 2 Gm. and then 1 Gm. every four to eight hours over a period of a week or ten days. It seems definite that secondary infections are reduced and that the majority of physicians using this drug have noted definite improvement from the disease, especially from corneal involvement.

Postoperative Infections.—Infection following intra-ocular surgical work usually manifests itself on the second or third day. Continued pain after the initial surgical reaction should have subsided is suspicious, and the eye should be inspected. One should not wait for the usual forty-eight or thirty-six hour interval. An infective process may be stopped by the use of sulfadiazine or sulfapyridine. The oral dosage is 4 to 6 Gm., initial dose, followed by 2 Gm. at the second and the third hour and thereafter by 1 Gm. every four hours around the clock. Continued treatment is usually indicated up to ten to twenty-one days, depending on the severity and the results obtained.

Late Infection After Trephining, Enophthalmos.—This process may be stopped by the use of sulfapyridine or sulfadiazine. The initial oral dose is 4 to 6 Gm.;

at the second and the fourth hour 2 Gm. is given and thereafter 1 Gm. every four hours around the clock. A cyclitic cataract may develop in this profound inflammation, and secondary glaucoma may develop associated with the lens swelling, requiring removal of the eye if other treatments fail.

Low Grade Dacryocystitis.—Strictures may be prevented and inflammatory processes resolved in some cases by irrigating through the lacrimal sac with tyrothricin 30 mg. per hundred cubic centimeters, every three to seven days. Some eyes are helped by the use of finely divided sodium sulfathiazole used as an emulsion. Treatment must continue over a period of months.

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ABSTRACT OF DISCUSSION

DR. ALAN C. WOODS, Baltimore: I agree with Dr. Heath as to the preparations to be taken in the administration of these drugs. Patients treated with these agents should be admitted to the hospital, and only in exceptional instances, and then with the restrictions outlined by Dr. Heath, should these drugs be administered to ambulatory patients. As concerns the "specific suggestions" offered by Dr. Heath in gonorrheal ophthalmia, traumatic cases, orbital abscesses, trachoma, postoperative infection and late infections after trephine operations, our experiences with these drugs in the Wilmer Institute has been similar to his. In other instances, notably with tyrothricin, our experiences have not been so happy. While tyrothricin *in vitro* is efficacious against the gram positive organisms and theoretically should be of considerable value in the treatment of infections with such organisms, in our hands its practical value is very doubtful. The action of the substance differs from that of the sulfonamides in that it is bactericidal instead of bacteriolytic. It is also toxic to tissues, causing damage to the corneal epithelium if used frequently and lysis of the red blood cells if given parenterally. It is a large molecule, does not penetrate tissues deeply after local application and is therefore little more than a tissue cleanser. In chronic dacryocystitis we have found it of no value. We have not used it in epidemic keratoconjunctivitis or dendritic keratitis. In experimental dendritic keratitis it did not alter or shorten the course of infection in rabbits. In the treatment of endogenous uveitis with sulfonamides our experiences have been constantly disappointing. In recurrent iritis, tuberculous uveitis, choroiditis and sympathetic ophthalmia the use of sulfonamides has repeatedly been without any clinical effect. In such specific conditions as metastatic meningococcic endophthalmitis the results from sulfonamide therapy have been spectacular. In general, excepting such specific instances, I am of the opinion that the use of sulfonamide therapy in endogenous uveitis is not justified. The present indications are that penicillin will probably be our most effective agent in combating infections with the gram positive organisms.

DR. WALTER S. ATKINSON, Watertown, N. Y.: The non-specific use of the sulfonamides should be avoided. The selection of the drug should be based on a precise knowledge of the bacteria concerned and the sulfonamide compound chosen that has the greatest bacteriostatic effect on the particular bacteria present. The empirical use of the sulfonamides locally, as for postoperative medication, is not only of questionable value but is contraindicated because it delays healing. Since the penetrability of the sulfonamide compounds varies greatly, particularly in regard to the eye, it is important to select the compound that penetrates the ocular tissues most readily so that a sufficient concentration can be maintained in the affected part. Methods suggested by Dr. Heath to increase the penetrability, and so the concentration of the sulfonamide compounds in the ocular tissues and fluids, should be carefully considered. The use of such measures as heat, iontophoresis or oxidizing agents which reduce the surface tension has been shown to increase the penetrability of the sulfonamides. The consensus is that in most instances a large dose of the sulfonamides for a short

period is preferable to a small dose over a long period. Inadequate concentrations of the drug not only may be ineffective in combating the infection but may produce hypersensitization or a sulfonamide fast organism. In ambulatory patients the sulfonamides should be used only with enforceable restriction and checks. In hospital patients the occasional complication of anuria might be avoided if the fluid intake and urinary output is watched closely. Frequent estimation of the blood level should be stressed. If an adequate concentration is not maintained, the purpose of the treatment is not accomplished and harmful reactions may be produced so that larger doses given later may be of little avail. Dr. Heath's concise paper with his specific suggestions is an excellent guide for ophthalmologists and should stimulate a desire to acquire an exact knowledge of the action and use of the new chemical compounds.

DR. JOHN G. BELLOW, Chicago: I should like to enlarge on a few points in the administration of sulfonamides. Oral administration is indicated when infection begins in the interior of the eyeball or orbit or has progressed beyond the reach of topical application, and in trachoma or gonorrheal conjunctivitis. In some conditions both oral and local administration may be the best form of therapy. A simple way to increase the concentration of sulfonamides in the cornea and the aqueous is by the addition of wetting agents such as aerosol or tergitol. Gutmann and I have shown by this means that the concentration in the cornea and aqueous can be increased fifteen-fold or more. Thus in some infections of the anterior segment of the eyeball this method, by decreasing the need for oral administration, diminishes the incidence of toxic reactions mentioned by Dr. Heath. Topical application of sulfonamide compounds to the eye is governed by certain local conditions. Sulfonamides are bacteriostatic; therefore, in the avascular cornea, the drug will be less effective than in a vascularized tissue which contains a full complement of leukocytes. Detritus, secretion and certain local anesthetics decrease the local effectiveness of sulfonamides. The drugs must be used with caution in traumatic lesions of the cornea, because in the absence of normal epithelium they cause a severe injury as shown not only by delaying the healing of the corneal epithelium but also by promoting the formation of scar tissue. Therefore in corneal abrasions and injuries the local use of a sulfonamide compound should be limited to cases in which dangers of infection outweigh the cosmetic and visual factors. I wish to add to Dr. Heath's discussion of the treatment of epidemic keratoconjunctivitis that sulfathiazole desoxyephedrine decreases rapidly the pain, lacrimation, redness and swelling associated with this disease without influencing the degree of scarring.

DR. RICHARD C. GAMBLE, Chicago: The specific suggestions Dr. Heath makes for treating the commoner ocular diseases set a standard which can be safely followed. I am in agreement with his suggestions with regard to inclusion blennorrhea, gonorrheal ophthalmia, hemolytic staphylococcus conjunctivitis and pneumococcic conjunctivitis. In regard to traumatic injuries, especially those with corneal abrasion, I would suggest less local use of sulfonamides and greatly stress the general use of them. There is no doubt that the local use delays healing and may cause more scar. There is also no doubt that the internal administration of sulfonamides is of great value in infected, perforating or lacerating injuries, both prophylactically and after infection is present. In regard to epidemic keratoconjunctivitis, I have had no experience with tyrothricin. I have never seen any benefit from sulfathiazole ointment in this condition and have felt in several instances that it was harmful. It is difficult to evaluate the effect of internal sulfonamide therapy in cases of orbital abscess. In all probability many abscesses are prevented by this type of treatment for severe colds and sinus infections. If the abscess develops, however, it usually has to be drained. The sulfonamides do not cause it to absorb, but the pain and general prostration are perhaps lessened. It is unfortunate that Dr. Heath did not give more space to the subject of uveitis. In my experience this treatment has been very good in cases of iritis with hypopyon, even when gonorrhea could not be proved as the cause. It has been entirely useless in the more chronic types except (and I do not know why) in sympathetic ophthalmia, where it

seems to hold the disease process in check, giving time for the natural healing processes of the ocular tissue to act. The important thing is to hold the cellular exudate and subsequent fibrosis to a minimum until the disease becomes inactive, because the exudate and fibrosis are the factors which obstruct the pupil and cause the secondary glaucoma and the opacities of the lens and cornea.

DR. PARKER HEATH, Detroit: The discussers have recognized that different therapeutic results are inevitable since variations in virulence of the infecting agent and individual immunity meet different methods of therapy. Mention of any one therapeutic substance gives a false emphasis to its values. Tyrothrycin is an example. Dr. Woods has pointed out its limitations used alone. Dr. Atkinson has given necessary emphasis to need for precaution in use of sulfonamide and similar compounds. Dr. Bellows has reported some methods of increasing penetration locally by means of vehicles which alter surface tension. Both he and Dr. Gamble warn of local use producing delayed healing and increased corneal scarring in abrasive lesions. The discussers are largely in agreement on the use of the conventional chemotherapeutic agents. A possible exception would be in the therapy of uveitis. Since these discussions simply report without elaboration, further details will have to be presented at another time. It is likely that there will be many new synthesized substances, especially in the acridine group, of high potency, diversity and relative safety in use. It is also likely that the leukopenia occasionally noticed with sulfonamide compounds may be prevented, but the responsibility increasingly remains with the physician to know the cause of the disease and then to prescribe the treatment.

DEMEROL

CAUTION IN ADMINISTRATION TO PATIENTS WITH INTRACRANIAL LESIONS

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In 1939 Eisleb and Schaumann¹ introduced 1-methyl-4-phenyl-piperidine-4-carboxylic acid ethyl ester hydrochloride as a compound which possessed so-called spasmolytic properties along with an analgesic action. During the past five years several score papers have appeared on the action of demerol, and it has been studied in both animal and human experiments. There are several reports which indicate that demerol may be associated with habit formation² and there is one case report in which demerol is reputed to have induced a delirium.³ Batterman⁴ states that the drug should be administered with caution to ambulatory and elderly patients because of the high incidence of dizziness and the possibility of syncope. I am not aware of any other reports on the human being which indicate any untoward or undesirable response to this drug other than phenomena classified as side effects, the more usual of these are dizziness, perspiration, dryness of the mouth and nausea.

The Winthrop Chemical Company of New York supplied the demerol. Demerol is known as eudalol, dolantin, dolantol and pethidine in other countries.

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¹ Eisleb, O., and Schaumann, O.: Dolantin, ein neuartiges Spasmodikum und Analgetikum (Ch. misches und Pharmakologisches). Deutsche med. Wchschr., 65: 967 (June 16) 1939.

² Kueher, T.: Zwei Fälle von Dolantinsucht, Klin. Wchschr. 19: 688 (July 6) 1942. Rojas, N., and Belby, J.: Habito toxico a dolantina, Sem. med., 2: 616 (Sept. 11) 1941. Hummelbach, ges. gerichtl. Med. 35: 17, 1941.

³ Addiction Liability of "Demerol" J. Pharmacol. & Addiction Liability of "Demerol" R. C. and Hummelbach (May) 1942. Batterman, R. C. and Hummelbach: A New Synthetic Analgesic—A Review of Its Comparison with Morphine, J. A. M. A. 122: 222 (May 1938).

⁴ Von Brücke, Stefanie: Ueber Dolantinabusus und einen Fall von Dolantindelir, Wien. klin. Wchschr. 52: 854 (Oct. 18) 1940.

⁵ Batterman, R. C.: Chemical Effectiveness and Safety of a New Synthetic Analgesic Drug, Demerol Arch. Int. Med. 71: 348 (March) 1943.

Batterman and his colleagues⁵ found that demerol (usual dose 100 mg., range 50 to 150 mg.) was "a potent, effective, and safe (medication) for the relief of pain due to a variety of medical and surgical conditions" and that "respiratory depression occurred rarely," in only 2 of the 774 patients who received demerol parenterally. Therefore it was deemed worth while to investigate the effect of demerol on patients

TABLE 1.—Distribution of Lesions

Lesions	Number
Right frontal meningioma	1
Cerebellar hemangioma	1
Left frontal subdural hematoma	1
Metastatic carcinoma	1
Schminke tumor	2
Chromophobe pituitary adenoma	3
Cranio cerebral injury	4
Intracranial glioma (various sites)	7

with intracranial lesions, in whom morphine sulfate is usually considered contraindicated because of its depressant effect on respirations and the alteration in pupillary response.

The observations listed in table 1 were made on 20 patients who had intracranial lesions. These patients received 100 mg. of demerol parenterally (unless stated otherwise) into the deltoid region. Data including blood pressure, pulse and respiratory rate were obtained before the drug was administered, and the so-called vital signs along with other pertinent observations were made at least each fifteen minutes, almost always by the same observer, for about three hours after the administration of demerol. All patients remained in bed during the course of these observations. Since the primary purpose of the study was an attempt to evaluate the safety of demerol in the type of case under consideration, I am including only those observations which are directly related to the question at hand. Hence, only those patients who showed what was considered an unsafe respiratory depression (a rate of 12 or less per minute for at least fifteen minutes) will be discussed in some detail. Seven individuals fell into this category; in five the rate fell to 12 per minute, while in 1 the rate went to 8 per minute and in another it reached a low of 4 respirations per minute. In the remaining 13 patients the respiratory rate fell from the premedication value of 18-22 per minute to a low of 16-18 per minute in 9 patients, 15 per minute in 3 and 14 per minute in 1.

TABLE 2.—Observations in Case 1

Time In Minutes	Comment	Pulse	Respiration	Blood Pressure
0	Demerol 100 mg.	69	18	110/70
15	Diaphoresis	60	14	
30	Sleeping	58	12	
45	Sleeping	52	12	
60	Sleeping	68	8	
75	Sleeping	52	14	110/70
195	Sleeping	60	15	

Abstracts on 3 of the patients who showed evidence of respiratory depression follow:

CASE 1.—R. G., a man aged 54, was rendered unconscious for two hours by a blow to the head. The patient sustained a comminuted fracture of the wall of the left orbit, and there

5. Batterman, R. C.: Demerol, A New Analgesic Drug, Effective for Relief of Pain in Medical and Surgical Conditions, Tr. Am. Ther. Soc. 41, 1941. Batterman, R. C. and Mulholland, J. H.: Demerol, A Substitute for Morphine in the Treatment of Postoperative Pain, Arch. Surg. 46: 304 (March) 1943. Rozenstue, E. A., and Batterman, R. C.: The Utility of Demerol as a Substitute for the Opium in Preanesthetic Medication, Anesthesiology 4: 126 (May) 1943. Batterman and Hummelbach: Batterman.

was a depressed fracture of the anterior wall of the left frontal sinus. There was persistent headache and dizziness but no drowsiness, nausea or vomiting. The left pupil was dilated, and there was a preponderance of the deep reflexes on the right side. The spinal fluid was xanthochromic for several weeks after admission, and at first the protein was elevated. This patient suffered from a cerebral concussion aside from his other injuries.

TABLE 3.—Second Series of Observations

Time in Minutes	Comment	Pulse	Respiration	Blood Pressure
0	Demerol 100 mg.....	64	18	110/70
15	.....	60	18	
25	Diaphoresis; drowsiness.....	58	17	
40	Headache eased; mouth dry.....	57	14	108/70
55	Very drowsy; slight headache.....	59	9	100/70
60-90	Pupils contracted—sluggish.....	56-60	12	105/70
105	Drowsiness.....	60	14	100/70
120	Pupils no longer contracted.....	60	18	
135-210	Became alert; headache returned..	60-64	14-20	90/65 100/70

On the sixth hospital day he was given 50 mg. of demerol by mouth. Within half an hour he became drowsy, his pulse rate fell from 72 to 52 per minute and his respiratory rate ranged between 18 and 20 per minute. Within two hours he was alert. His headache, which had eased but did not disappear, began to increase. There was never any significant change in blood pressure.

Four hours after this initial dose the patient received 100 mg. of demerol in the deltoid region.

On the seventh hospital day the patient received another 100 mg. of demerol parenterally. The pulse fell from 64 to a minimum of 56 and the respirations from 18 to 14 without a significant change in blood pressure. The patient reported only 0 per cent relief of headache." He experienced nausea and vomiting and had contracted pupils. All these symptoms and signs persisted for about an hour.

On the ninth hospital day 100 mg. of demerol was again administered parenterally (table 3).

On the fourteenth hospital day the patient received 50 mg. of demerol by mouth without any especial change in pulse, respirations or blood pressure. No side effects were noted, and the patient's severe headache was not altered. Four hours later another 50 mg. was administered, and no untoward response was noted except for the fact that the respirations fell to 14 per minute. The patient did not notice any amelioration of his headache.

CASE 2.—M. P., a man aged 36, was admitted five days after a generalized seizure. Since the convulsion he had had severe bifrontal headaches, nausea and vomiting. The patient was restless and had bilateral papilledema of 1.0 to 1.5 diopters with fresh flame shaped hemorrhages. Subsequent craniotomy revealed a right frontal astrocytoma.

Two days after admission the patient received his first dose of demerol (table 4).

TABLE 4.—Observations in Case 2

Time in Minutes	Comment	Pulse	Respiration	Blood Pressure
0	Demerol 100 mg.....	50	19	105/70
15	Severe headache persists.....	52	19	120/90
30	Nausea, vomiting, diaphoresis....	48	12	110/80
45	Headache has eased considerably..	47	12	110/80
60-120	Free from headache; drowsiness..	46-54	14-16	100/70
210	Headache returning.....	61	18	

On the fourth hospital day another 100 mg. of demerol was administered. There was rather a similar sequence of events. Within forty-five minutes the respirations dropped to 12 per minute for half an hour, and during this period the respirations were irregular. The pulse slowed, and there was no significant change in blood pressure. The patient had a pronounced diaphoresis, nausea and vomiting. Incidentally he did not have any nausea or vomiting during the preceding twenty-four hour period. The patient was drowsy for about two hours and there was some relief from the severe headache, but this was not very definite.

CASE 3.—C. McC., a woman aged 50, was admitted with a history of "depression" for five months and confusion and lethargy for two weeks. The patient also suffered from headaches and at the time of admission she was somewhat confused and exhibited a right hemiparesis with decidedly overactive reflexes, more so on the right. Two diopters of papilledema was present. At the time of operation, on the fifth hospital day, a left posterior parietal flap was turned and pronounced edema of the brain was observed. This observation along with the ventriculogram was deemed suggestive of a glioblastoma multiforme.

The patient was given demerol on the second hospital day (table 5).

Duguid and Heathcote⁶ reported their observations on cats under urethane and ether anesthesia. They state that "the respiration was invariably affected in any dosage from 1 mg./kg. upwards. With small amounts the result was merely a slight, though prolonged degree of slowing of the rate." These investigators observed that 5 mg. per kilogram doses induced a great reduction in respiratory rate and amplitude along with some irregularity. Single 10 mg. per kilogram doses induced an immediate and permanent cessation of respiration. Also a cumulative effect on respiration was noted following a total dose of 8 mg. per kilogram. The findings of Schaumann,⁷ Barlow⁸ and Gruber, Hart

TABLE 5.—Observations in Case 3

Time in Minutes	Comment	Pulse	Respiration	Blood Pressure
0	Demerol 100 mg. in deltoid.....	96	18	160/100
15	.....	92	18	160/110
30	Feels warm; severe headache.....	82	16	200/140
45	Diaphoresis; sleeping.....	82	14	200/130
60	Irregular respiration; long period of apnea.....	82	4	200/110
75	Pupils small, very sluggish to light	78	16	100/110
90	Pronounced drowsiness.....	82	24	170/100
105	Headache lessened.....	76	24	170/110
120	Irregular respirations persist.....	80	26	165/160
135	Periods of apnea.....	78	18	160/100
150	Still somewhat drowsy.....	78	16	160/100
165	Less drowsy; respirations regular	82	18	165/110
180	Pupils no longer contracted.....	80	24	170/110

and Gruber⁹ confirm the observations on respiratory depression in animals.

Batterman¹ reported 774 cases in which demerol was administered parenterally, and in only 2 instances was any respiratory depression noted. The data obtained from our comparatively small and selected group of cases did not, we feel, warrant the risks of further clinical investigation on patients with intracranial lesions. There was definite respiratory embarrassment in 7 of the 20 patients, and this finding alone should serve as a caution against further use of the drug for patients with intracranial lesions.

Batterman¹ states that he did not observe any change in the pupillary response, while the corneal reflex was diminished or abolished in 80 per cent of the cases. There were, however, 7 instances in this series in which contracted pupils developed after the administration of demerol. Instances of corneal hypalgesia and analgesia were observed.

6. Duguid, A. M. E., and Heathcote, R. St. A.: Pharmacological Action of Ethyl Methylphenyl Piperidine Carboxylate, *Quart. J. Pharm. & Pharmacol.* **13**: 318 (Oct.-Dec.) 1940.
7. Schaumann, O.: Ueber eine neue Klasse von Verbindungen mit spasmolytischer und zentral analgetischer Wirksamkeit unter besonderer Berücksichtigung des 1-Methyl-4-Phenyl-Piperidin-4-Carbonsäure-Äthylesters (Dolantin), *Arch. f. exper. Path. u. Pharmacol.* **196**: 109, 1940.
8. Barlow, O. W.: Personal communication to Batterman and Himmelbach.²
9. Gruber, C. M.; Hart, E. R., and Gruber, C. M., Jr.: The Pharmacology and Toxicology of the Ethyl Ester of 1-Methyl 4-Phenylpiperidine 4-Carboxylic Acid (Demerol). *J. Pharmacol. & Exper. Therap.* **73**: 319 (Nov.) 1941.

CONCLUSIONS

Twenty patients with intracranial lesions were given demerol parenterally in therapeutic doses on one or more occasions. In 7 of the 20 patients the respiratory rate fell from the usual rate of 18-22 per minute to 12 per minute or less. In 5 patients respirations fell to 12 per minute, in 1 patient to 8 per minute and in another patient to 4 per minute. Also instances of contracted pupils with sluggish response to light were observed.

It is felt that, from the data which are at hand, demerol should be administered with caution, if at all, to patients with intracranial lesions.

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INDUSTRIAL AND DOMESTIC INJURIES
OF THE EYE

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Wounds of the eye vary in type and severity according to the type of agent and the amount of force that produced them. Injuries in industrial and domestic life differ from those that occur in military service in that the forces exerted in their production are of different origin and violence. War injuries occur from high explosive bombs, flying fragments of rock and other debris, chemical gas burns, and from the many other modern engines of warfare. War wounds of the eye are accompanied frequently by injuries to the body trunk, face and skull. Both eyes may be damaged. Many different types of ocular injuries may occur to the same person. If a penetrating wound of the orbit or globe is present, more than one foreign body, usually non-magnetic, may be lodged in the tissue.

Industrial and domestic accidents resulting from other sources of power are on the whole less violent than those that occur in battle. They seldom involve both eyes, are single and are accompanied less frequently by trauma to other parts of the body.

Industrial accidents come from plants that are manufacturing articles with power driven machinery, transportation systems, mines, chemical supply depots and heavy trades. There is ample opportunity for injuries to occur to workmen. The incidence of injury is kept at a minimum by the safety measures instituted for that purpose. Safety engineers, machine guards, protective goggles and the educational safety campaign all contribute to reduce the incidence of industrial injuries. It is obviously impossible to eliminate accidents from the factory entirely, and particularly is this true when there is as large an influx of inexperienced workers as under present conditions.

A certain number of ocular injuries occur in homes and in agriculture. The domestic accidents occur with sharp and pointed articles such as knives and scissors, with various chemicals and with heat. A good illustration of the latter is that associated with improper operation of a pressure cooker. The farm has been mechanized and it is now necessary for the farmer to operate and service equipment that is made with precision and of as many metal alloys as are found in equipment in the factory or on the railroad. The farmer is exposed to ocular injury, and yet it is most unusual for him to possess protective goggles. A short time ago it was my duty to care for a farmer who lost one eye from striking

a chisel with a hammer while repairing a lock on a gate. It is more difficult to conduct an efficient educational safety campaign in the home and on the farm than it is in the factory. The latter offers the greater hazard, but it is much easier there than elsewhere to keep ocular injuries at a minimum.

The first step in consideration of ocular injuries is efficient means to prevent accidents. It is impossible to prevent all injuries of the eyes but the number can be kept at a low percentage compared with the man hours of work.

The second step is prompt and efficient first aid treatment of the injured workman. This may be the copious washing of the eye with tap water by the injured person after a chemical burn. Fellow employees may be taught to give valuable assistance during the time required for the plant physician to reach the scene of the accident. Almost all factories, both large and small, have a first aid station where sterile dressings and medicines are available. The larger factories have physicians in constant attendance.

A greater number employ a registered nurse who administers simple first aid treatment and is under the supervision of a physician on part time duty. First aid treatment should be administered by an experienced person, preferably by a nurse or a physician. The fellow employee may be more dangerous than helpful unless he has been taught by a physician what steps to take. Some years ago I treated a man who was given first aid by a fellow employee for a superficial foreign body injury of the cornea. The foreign body was not removed. Tincture of iodine was mistakenly applied to the eye for mild protein silver.

I do not think that a foreign body that clings to the tissue or is embedded should be removed from the eye by any one other than a physician. He should be provided with proper equipment for illumination and magnification of the eye and should observe strict asepsis in the sterilization of the instruments and in the care of the wound.

Superficial injuries of the eyeball constitute the larger number of all ocular injuries. Each one should be viewed as being potentially dangerous. Bacteria may be introduced into the tissue by the foreign body itself, by the instrument used in the removal of the foreign body or from the lacrimal apparatus or infected conjunctiva before the wound becomes covered with epithelium. For the past several years I have instilled plain cod liver oil whenever there has been a break in the epithelium of the cornea as after the removal of an embedded foreign body, an abrasion or a burn. It has proved to be exceptionally soothing for electric flash burns involving the cornea. The recent addition of a local anesthetic found to be soluble in cod liver oil has enhanced its value.

All simple or superficial injuries of the eye ball should be examined with great care, for what appears to be a minor injury may indicate the presence of an intraocular foreign body.

The care of intraocular foreign body injuries is not considered in this article, but emphasis must be placed on alertness of the ophthalmic surgeon to detect the presence of one after a penetrating injury has occurred.

Injuries of the eyelids in industrial and domestic pursuits are as a rule limited to punctures, contusions, lacerations and burns. Surgical attention to injury of the eyelids requires the application of those principles of surgery employed for other parts of the body. During repair of an interruption of the continuity of the eyelids

attention is given to the direction of the fibers of the orbicularis oculi muscle, the attachment of the levator palpebrae muscle, good apposition to the cut margin of the eyelid and careful reapposition of the tissue when the lacrimal apparatus is involved in the injury. Owing to the vascularity and laxness of the eyelids, much greater edema and discoloration occur than from similar injury to other parts of the body.

The same force that produces a contusion of the eyelid may fracture the bony rim or the walls of the orbit. Examination of the parts should be made by palpation and with the x-rays.

An interruption of the continuity of the eyelid may suggest the presence of an orbital foreign body or an opening into the eyeball. All foreign bodies should be removed from the tissue whenever possible. Some substances are tolerated by the tissue with but little reaction. Foreign bodies in the orbit that do not introduce sepsis or chemical irritation may be permitted to remain if their removal would require extensive surgical trauma. An opening into the eyeball requires prompt careful surgical repair if the eye is to be retained and should be done before repair of the eyelids is undertaken. The use of the sulfonamide compounds both locally and internally for injury of the eyelids is a recent advance. Appropriate serums and antitoxins are to be administered according to the surroundings where the accident took place.

Injuries of the eye are influenced not alone by the force and the agent of their production but also by the atomic protection that nature has provided. The eyeball is protected by the eyelids and the bony walls of the orbit and skull. The orbit may be described roughly as cone shaped with the apex at the optic foramen and the base formed by the eyelids. The contents of the orbit play a part in the function and the control of the eye and act as intermediate protective tissue in that they cushion it against the reception of violent force.

The shape of the eyeball is an example of structural defense. It may be described as a sphere with the cornea being a portion of a smaller sphere superimposed on it in front. This gives the maximum strength that is possible to the walls and protection to the tissue contained within.

The shape and the structure of the eyeball lead to certain types of injury. The weakest places in the wall of the eyeball are at the junction of the cornea with the sclera and at the entrance of the optic nerve into the sclera. With a hard blow a break in the tunic of the eyeball will occur at these places. The shape of the eyeball, being essentially a sphere, leads to injury of the internal structures by contrecoup.

Injury to the intraocular structures without a perforating wound may involve any of them, and the ones most commonly damaged are the iris, the ciliary body, the lens, the retina and the choroid. Laceration of the sphincter muscle of the iris and iridodialysis are common findings following a blow on the anterior portion of the eyeball. Hemorrhage may be extensive. The lens capsule may be interrupted by a sudden sharp blow on the eyeball when sufficient force is exerted to indent the ocular coat enough to rupture the lens capsule. Traumatic cataract is the result. The opacity frequently begins in the posterior cortex. Injury of the retina and choroid may vary from edema to laceration of the tissue or to detachment of the retina.

The care of nonpenetrating injuries of the eyeball is at first symptomatic: sedative drugs for pain, rest in

bed, cold or hot compresses, and atropine to abolish accommodation and to put the iris at rest. Detachment of the retina requires early surgical attention. Traumatic cataract is to be treated surgically according to the development of the opacity and the other conditions of the eye. Secondary glaucoma must be treated according to the general rules for this condition and according to the experience of the surgeon.

Penetrating wounds of the eyeball comprise the more dangerous and destructive group of injuries. The presence of an intraocular foreign body must be considered and when there is a possibility of one being within the eyeball it must be searched for. To overlook one is to invite permanent loss of vision with other and more grave consequences—recurrent uveitis with possible sympathetic ophthalmia of the second eye. When the eyeball is to be retained, the wound is cleansed, prolapsed tissue is cut away and the wound margins are united as accurately as possible with fine sutures. Laceration of the cornea is protected by some form of sliding conjunctival flap until the wound of the cornea has united, and then the flap returns to its original site. Prolapse of the ciliary body and choroid never should be treated by removal of the prolapsed tissue. An injury through the zone of the ciliary body, particularly with prolapse of tissue, is ideal for the production of sympathetic ophthalmia. When the eyeball has been damaged so severely that there is no prospect of retaining useful vision, enucleation should be done at once. It is more conservative to remove a severely damaged eyeball than it is to retain one and invite sympathetic ophthalmia which may mean blindness in both eyes. Care and judgment must be exercised by the surgeon when a decision is made concerning enucleation of an injured eyeball. For the injured eyeball not removed, careful medical attention and nursing are necessary.

SUMMARY

1. The prevention of ocular injuries commands an important place in industry, agriculture and the home.
2. Efficient first aid treatment is important in reducing the loss of man hours of work, in relieving the suffering associated with the injury and, most important of all, in retaining useful vision of the injured eye.
3. Penetrating and nonpenetrating wounds are treated according to the rules that have been proved best by years of experience of the medical profession.
4. Particular care should be taken to avoid sympathetic ophthalmia when there has been an injury of the uveal tract, especially of the ciliary body.

23 East Ohio Street.

ABSTRACT OF DISCUSSION

DR. WILLIAM F. HOLZER, Worcester, Mass.: In my community, where industries are essentially machine tool, abrasive machinery, i. e. grinding wheels, rolled steel and wire drawing, we do not encounter the severe mutilating wounds common to mine accidents or munition plants explosions. Most injuries are foreign bodies in the cornea or abrasions of the cornea. The air hose in cleaning casting is responsible for a number of injuries, as the small chips are blown in the eyes around the glasses or under the side shields. Occasionally a grinding wheel will break, inflicting more serious injury. Our practice is to remove the foreign body, curet the cornea thoroughly, cauterize with 95 per cent phenol and leave the eye uncovered. Sulfathiazole (5 per cent ointment) is applied in the lower cul-de-sac and a tube of 1 per cent phenacaine hydrochloride and epinephrine 1:50,000 ointment dispensed, to be used every hour or two as required. Atropine is not used, as the accommodation is disturbed long after the corneal wound has healed and the workman finds it difficult to do his work well, particularly if

he is doing precision work. More serious wounds are treated as outlined by Dr. Clark. As to domestic injuries, we see the ordinary incised wounds of the cornea and sclera caused by scissors, and knife wounds by cutting knotted shoe laces or string on bundles. A rather common injury is a corneal abrasion caused by infants' fingernails. These may be extensive and very painful; usually phenacaine ointment and a pad will facilitate healing. Another not uncommon domestic injury is that caused by the BB shot. In my experience most of these are extraocular, i. e. in the lids, under the conjunctiva or passing around the sclera rather than penetrating. If accessible they are removed, but if removal is likely to produce considerable trauma they are left in situ. X-ray examination should be made and the patient or parents advised that the foreign body has not been removed. This avoids legal complications. If any foreign body cannot be removed with a cotton applicator by a nurse, the patient should be referred to a physician, and any person with a foreign body in the pupillary area should be referred to an ophthalmologist. The use of safety goggles should be made obligatory in all hazardous occupations and neglect to wear them punishable by lay off periods or discharge for frequent violations. The presence of an intraocular foreign body should not be overlooked, particularly with a history of a hammering operation. In such cases an x-ray examination should always be made to rule out the presence of a foreign body and to avoid future embarrassment.

DR. HUGO L. BAIR, Rochester, Minn.: A common error is the failure to remove early enough a blood clot that fills the anterior chamber following contusion of an eye. Many such eyes have been lost owing to hematogenous infiltration of the cornea and secondary glaucoma. If, within a day after the injury, clear aqueous cannot be seen above the blood in the anterior chamber, it is wise to open the anterior chamber and wash out the blood and remove the clot. It is inadvisable to do this immediately after the contusion because of the likelihood that the source of the bleeding has not become well closed and that further hemorrhage may follow sudden lowering of intraocular pressure. The immediate treatment of such contusions should be to put the patient at absolute rest in bed with both eyes bandaged. I prefer to use neither atropine nor miotics at first, relying simply on rest in bed and the complete bandaging of both eyes to keep the injured eye internally and externally at rest. There is overuse of the conjunctival flap for penetrating lacerations of the cornea. Although once a staunch user of it, I recently have considered it to be an unnecessary evil and have abandoned its use in such cases. Preparation of a conjunctival flap causes considerable additional trauma to and subsequent reaction in the already injured eye. It prevents satisfactory observation of the site of the wound and may conceal the development of hypopyon, iridocyclitis or other intraocular complications of the injury. Along the margins of the flap on the cornea, mucus and debris usually collect to the detriment of the healing processes. With large lacerations of the cornea, the tension exerted by a flap may cause inversion and improper apposition of the edges of the wound. With ragged or infected corneal wounds, adhesions of the flap to the healing wound frequently occur, causing dense leukomas and much corneal irregularity. The larger corneal lacerations should be closed with corneal sutures approximately $\frac{1}{4}$ inch apart. This does not make such a tight closure that aqueous cannot seep out a bit between the edges of the wound, which I believe to be desirable, and yet it keeps the edges of the wound in good enough apposition for proper healing. Usually with corneal wounds of about $\frac{3}{8}$ inch length or less, sutures are not necessary.

DR. EDWARD W. GRIFFEY, Houston, Texas: The microscopic appearance of the fully developed reaction to flash burns of the eye after exposure to the welder's arc is characteristic. In the cornea initially there is nuclear chromatolysis associated with a swelling and edema of the cytoplasm. Thereafter acidophil staining becomes evident in the nucleus, which progresses to the formation of highly refractive red granules within it; these coalesce into discrete "inclusion bodies," which may even-

tually replace the whole of the nucleus. Finally the inclusions may be extruded from the nucleus into the cytoplasm and thereafter the cell dies; it is desquamated if it is a superficial one. The clinical course of such an exposure is typical. Early there is a latent period during which time no effects are visible. Between the latent period and the beginning of the acute symptoms, when the corneal edema is obvious and typical halos are most evident in the human subject, the cornea becomes practically anesthetic. The latent period varies in length inversely as the severity of exposure, averaging from eight to twelve hours. At the end of this time there is a rapid onset of a severe, sharp, continuous ocular pain associated with profuse lacrimation, photophobia and later blepharospasm. At this time the cornea shows a slight irregularity of its reflex and a stippling of its surface, which takes on stain with fluorescein. Even before the onset of corneal pain the patient may experience a pricking sensation about the eye, may see halos about lights (due to corneal edema), and there is seen an erythema of the skin of the lids on the side involved. The clinical picture is at its height in thirty-six to forty-eight hours after irradiation. Thereafter it gradually clears up until, four or five days later, the cornea becomes clear again, the conjunctival injection dies down and the eye becomes normal in eight to ten days. A simple and effective remedy, which in the early initial phase amounts to a good prophylaxis, consists in the use of epinephrine. That is, if three successive instillations of 1:1,000 epinephrine are made at five minute intervals shortly after the onset of ocular pain following flash burn and before objective findings are too obvious, the large majority of patients gain prompt relief and can return to work immediately. The severely burned will require 0.5 per cent pontocaine or 1 per cent holocaine.

DR. ALBERT C. SNELL, Rochester, N. Y.: In industry adequate provisions for rendering such aid should be available in every plant both large and small. These provisions should include proper equipment and supplies, also definite written instructions which are to be followed by the available personnel. Such equipment, supplies and instructions are almost entirely lacking in the small industrial plants; hence the greater relative loss of vision in these plants and the need for better care. The only exception which I wish to take is to the statement that "prolapse of the ciliary body and choroid never should be treated by removal of the prolapsed tissue." Dr. Clark does well to warn of the possibility of sympathetic ophthalmia in these types of injury. However, in my opinion small or medium sized prolapsed parts of the ciliary should be amputated thoroughly. I would also institute sulfonamide therapy together with atropine and antiseptics. But one should always be alert to the possibility of sympathetic involvement! Some of these injured eyes can be saved and should be when vision has not been severely damaged. Since the first week following these injuries is free from the danger of sympathetic ophthalmia, these injured eyes may be kept under observation, at least during this time, without unwarranted risk. In minor degrees of prolapse of the choroid, usually with some vitreous, amputation should be done and prophylactic treatment employed. This can be done without much danger of sympathetic ophthalmia. However, extensive prolapses and a blind eye suggest removal of the eye. Atropine should not be instilled in every injured eye, especially in superficial foreign body injuries—a practice which is commonly followed by first aid personnel. This practice causes much unnecessary lost time for employees. The use of atropine should be left to the ophthalmologist. There is need of a better ophthalmic service in most industrial plants.

DR. C. P. CLARK, Indianapolis: The subject can be summarized briefly: an aggressive educational campaign to prevent accidents where they are most likely to occur, prompt and efficient emergency care for the injured, and employment of good ophthalmic surgical practices for those persons more seriously injured. The methods of accomplishing these aims may vary according to the locality and the facilities that are available.

Clinical Notes, Suggestions and New Instruments

GASTROJEJUNAL HEMORRHAGE FOLLOWING GASTROENTEROSTOMY FOR HYPERTROPHIC PYLORIC STENOSIS OF INFANCY

LIEUTENANT COMMANDER G. ARNOLD STEVENS (MC), U.S.N.R.
AND WILLIAM C. BOECK, M.D., LOS ANGELES

Prior to the introduction of the Rammstedt operation, hypertrophic pyloric stenosis was treated surgically by gastroenterostomy. Although the newer procedure, which has since been universally adopted, was first described by Rammstedt in 1912, certain surgeons persisted for some time in making gastroenterostomies on infants with congenital pyloric stenosis.

To our knowledge 4 cases have been reported in medical literature because of bleeding incident to gastrojejunal ulcer following gastroenterostomy for hypertrophic pyloric stenosis. The ages of these patients at the time they presented themselves for definitive surgery ranged from 22 to 30 years. The first case was reported in 1940 by Fowler and Hanson¹ and treatment was taking down the gastroenterostomy and making a conservative type of pyloroplasty. In 1941 Waltman Walters² reported 3 cases in which he took down the gastroenterostomy and made the Billroth I type of anastomosis. So far as we have been able to ascertain, all 4 of these patients have remained well following the final surgical procedures.

We add 5 cases to those previously reported (4 through the courtesy of Waltman Walters,³ Edward J. Donovan⁴ and John Ruddock⁵ and 1 of our own). One year ago Walters took down the gastroenterostomy and made a Billroth I anastomosis on a young man who had previously been operated on for perforation of a gastrojejunal ulcer by Donovan, with a result which has been satisfactory to date. Donovan also made a Billroth I resection and took down the gastroenterostomy on a man aged 29 for a large bleeding jejunal ulcer following gastroenterostomy performed at 6 weeks of age for hypertrophic pyloric stenosis. Donovan stated to us that "the pylorus was exactly like those found in cases operated on in infancy." Ruddock has seen 3 cases of hypertrophic pyloric stenosis in one family. Two brothers (26 and 28 years old) had gastroenterostomy performed in infancy. Both of these began to bleed at the age of 24 years. The one 28 years old received x-ray therapy less than two years ago and has not bled since. The other (26 years old) also had x-ray therapy and has since had a recent hemorrhage. X-ray examination revealed partial duodenal obstruction in both of these cases. The sister had a Rammstedt operation. She has had no bleeding and has been clinically well.

The case we report differs from the others in two respects. In addition to the taking down of the gastroenterostomy a radical type of pyloroplasty was effected and a segment of the jejunum containing four ulcers, one of which was actively bleeding, was removed.

REPORT OF CASE

A white man aged 31 was admitted to the hospital by one of us (Boeck) with a diagnosis of hemorrhage probably incident to gastrojejunal ulcer. Gastroenterostomy had been performed when he was 6 weeks old for hypertrophic pyloric stenosis. At the age of 19 years his first hemorrhage occurred. At this time he vomited "coffee ground" material and had "tarry" stools. He stated that the attending doctor told his family that

he was in "shock" as a result of severe hemorrhage of the stomach. All in all, nine hemorrhages occurred during a twelve year period, the last of which was on the date of his admission to the hospital. The shortest period between hemorrhages was one month. The longest period was two and one-half years. In 1938 gastric analysis at the Presbyterian Hospital of Pittsburgh showed total acids 36, free acids 24 and loosely combined acids 12. About two months before the onset of the last hemorrhage x-ray examinations showed some pyloric obstruction but were otherwise negative. Gastroscoy did not reveal gastrojejunal ulcer.

After conservative medical treatment for one week in the hospital the patient persisted to bleed, so it was felt safer to intervene surgically. The patient was given 1,000 cc. of whole blood by transfusion immediately before operation, after which the blood pressure was 110 systolic, 60 diastolic. The blood count at this time showed 3,800,000 red cells, 10,000 white cells and hemoglobin 65 per cent. All other routine laboratory tests were negative.

Operation was performed by one of us (Stevens). The gastroenterostomy was taken down and a segment of jejunum was removed containing a diverticulum at the suture line and four jejunal ulcers. The largest of these contained an actively bleeding vessel. The opening in the stomach was closed and intestinal continuity was reestablished by end to end anastomosis of the jejunum. Because of partial obstruction caused by the hypertrophied musculature of the pyloric region, a radical type of Judd pyloroplasty was made, the wedge on each side being excised far posteriorly. This left but a small section of gastroduodenal tissue to serve as an anchor for the suture line. The postoperative convalescence was uneventful. The patient was dismissed from the hospital on the ninth postoperative day. He has been well since (one and one-half years).

PATHOLOGY

The diagnosis made by the pathologist was multiple ulcers of the jejunum, acute and chronic, with one diverticulum.

The specimen consisted of a section of jejunum including the gastrojejunal suture line. Protruding externally from the posterior suture line was a diverticulum 8 mm. deep with a base 5 mm. in diameter. There were four jejunal ulcers, the largest of which was 8 mm. in diameter and the smallest 5 mm. in

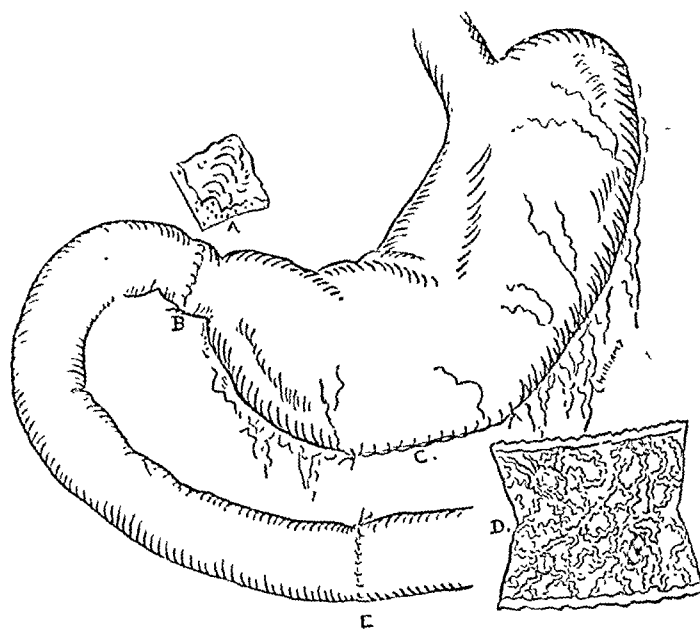


Fig. 1.—A, section of pylorus removed; B, reconstructed pyloric region; C, closure of defect in stomach; D, excised jejunum showing four small ulcers; E, jejunal continuity reestablished by end to end anastomosis.

diameter. Two of the ulcers appeared acute. The larger was deep and contained an open vessel, which was apparently the spurting artery seen as the jejunum was opened at operation. Two of the ulcers appeared chronic and were covered with a gray base, apparently scar tissue. The bowel wall, corresponding to the larger of these, was thinned out so that it produced a false diverticulum.

This article has been released for publication by the Division of Publications of the Bureau of Medicine and Surgery of the U. S. Navy. The opinions and views set forth in this article are those of the writers and are not to be considered as reflecting the policies of the Navy Department.

1. Fowler, L. H., and Hanson, W. A.: Gastrojejunal Ulcer Following Gastroenterostomy Performed Twenty-Four Years Before for Pyloric Stenosis of Infancy, *Minnesota Med.* 23: 602 (Aug.) 1940.

2. Walters, Waltman: Partial Gastroenterostomy (Billroth I) for Hemorrhagic Gastrojejunitis Following Pyloric Stenosis, *Proc. Staff Meet., Mayo Clin.* 16: 321 (May 21) 1941.

3. Walters, Waltman: Personal communication to the authors.

4. Donovan, Edward J.: Personal communication to the authors.

5. Ruddock, John: Personal communication to the authors.

Histologic sections through the acute ulcers showed absence of the mucosa with congestion of the submucosa and invasion by polymorphonuclears and lymphocytes. Section through the chronic ulcers showed absence of mucosa and submucosa and replacement with connective tissue.

COMMENT

The cases reviewed in this report present certain factors in common. In all gastroenterostomy was performed in infancy for hypertrophic pyloric stenosis. All showed a partial persistence of the pyloric defect. In all there were repeated hemorrhages incident to jejunal erosion or ulceration and all were cured by the combined surgical procedures of taking down the gastroenterostomy and correction of the partial pyloric obstruction. None of the patients had gastric or duodenal ulcer.

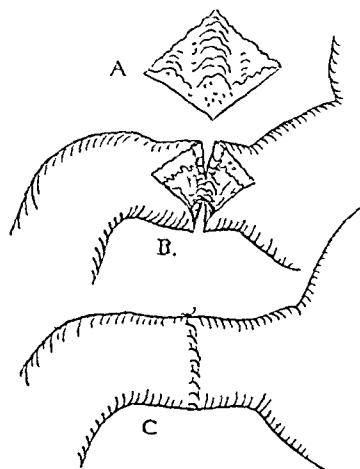


Fig 2—A, excised gastrojejunal segment showing hypertrophied musculature of the pyloric region; B, gastrojejunal defect following excision of A; C, reconstructed pyloric outlet.

There were several interesting features in the report of the cases of Walters. In 2 of these pyloroplasty had been performed elsewhere and in 2 cases perforating jejunal ulcers had been excised with simple closure of the jejunum. In none of these was cure effected until the gastroenterostomy had been subsequently taken down. Reduction of gastric acidity was noted by Walters in 3 cases after taking down the gastroenterostomy and making a Billroth I type of gastric resection. In 1 of his cases relative achlorhydria was present before surgery.

In our case also relatively low acids existed before the operation was performed. Thus 2 cases of the small group reported showed relatively low gastric acids before operation, yet the same pathologic condition developed as in those with normal or high acids. Is it then reasonable to place too much importance on gastric acidity as a major factor in the pathogenesis of gastrojejunal ulcer in this type of case? It is true that one of the patients seen by Ruddock received x-ray therapy in the hope of preventing further ulcer formation by lowering gastric acidity. This patient has not bled for almost two years. On the other hand, our patient went as long as two and one-half years between hemorrhages and he had received no x-ray therapy. It seems reasonable to assume that the patient who did have x-ray treatment will probably bleed again.

Gastroscopy between hemorrhages on our patient was negative. It therefore appears that the jejunal erosions and ulcerations tend to heal intermittently and that the healing is only temporary.

Since our patient showed relatively low acids, it seemed to us unnecessary to subject him to the added risk of any type of gastric resection. Therefore the obstruction was treated by pyloric reconstruction.

All of the patients have remained cured after the gastroenterostomy was taken down, with adequate correction of the pyloric defect, regardless of whether the procedure of gastric resection or pyloroplasty was used.

More time must elapse before the relative merit of these procedures can be evaluated conclusively. It does seem reasonable to conclude, however, that any combination of surgical procedures must include taking down the gastroenterostomy in order to effect a cure of this condition.

Committee on American Health Resorts

THE COMMITTEE ON AMERICAN HEALTH RESORTS HAS AUTHORIZED PUBLICATION OF THE FOLLOWING STATEMENT ON THE ACCEPTANCE OF THE TORBETT CLINIC AND HOSPITAL. A COPY OF THE RULES ON WHICH THE COMMITTEE BASES ITS ACTION WILL BE SENT ON REQUEST.

W. W. BAUER, M.D.

TORBETT CLINIC AND HOSPITAL, MARLIN, TEXAS, ACCEPTABLE FOR LISTING BY COMMITTEE ON AMERICAN HEALTH RESORTS

The Torbett Clinic and Hospital, Marlin, Texas, applied for listing by the Committee on American Health Resorts of the American Medical Association. The Committee has been furnished with all the information required under its rules, including copies of advertising and promotional material, and a report on an inspection by a Committee representative. The submitted information and the report indicate that the institution is operated in accordance with the rules of the Committee. The distribution of advertising material not in accordance with these rules has been discontinued.

The Committee on American Health Resorts is satisfied that Torbett Clinic and Hospital is being operated in accordance with the rules of the Committee and has placed this institution on the list of American Health Resorts complying with the Committee rules for a period of one year beginning Nov. 1, 1943. This listing may be continued for three year periods if the listed institution continues to comply with the rules.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.

HOWARD A. CARTER, Secretary

DISINFECTAIRE ULTRAVIOLET GERMICIDAL UNITS

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ACCEPTABLE

Manufacturer: Ait Metal Company, 1814 East 40th Street, Cleveland

The Disinfectaire Ultraviolet Germicidal Units Nos. 2543, 2545 and 2607 are designed to irradiate the upper air of a room with ultraviolet radiation for disinfecting purposes. The fixtures are said to be so designed that when correctly installed there is little or no direct irradiation of individuals. Unit No. 2543 is described as a "Standard Indirect Type," Unit No. 2545 a "Bactericidal Barrier Direct-Indirect Type," and Unit No. 2607 is termed a "Suspended Bactericidal Barrier Direct-Indirect Type."

The source of irradiation in each of the models is the General Electric 30 watt germicidal lamp. This lamp is described in the Council report "Ultraviolet Lamps for Disinfecting Purposes."¹ Careful consideration should be given to the introductory statement of this report because it presents detailed information about the limited conditions under which the units may be employed efficaciously.

In the aforementioned report it is pointed out that Council acceptance is limited to ultraviolet disinfecting lamps designed for installation in hospital nurseries, hospital wards and operating rooms where the radiation has been found useful as an adjunct to other measures of asepsis. Ultraviolet lamps are not accepted for disinfecting air in schools, waiting rooms, public gathering places and large halls because satisfactory evidence is not available to warrant their acceptance for such purposes. For the same reason the units are not accepted for disinfecting solids such as drinking cups, combs, brushes, shaving utensils, toilet seats and shoes.

The Council voted to accept the Disinfectaire Ultraviolet Germicidal Units Nos. 2543, 2545 and 2607 for inclusion in its list of accepted devices.

1. Council on Physical Therapy: Ultraviolet Lamps for Disinfecting Purposes. J. A. M. A. 122:62 (Sept. 11) 1947.

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SATURDAY, JANUARY 15, 1944

THE PHYSICIAN AND THE FOURTH WAR LOAN

Nervi belli pecunia infinita (The sinews of war are infinite money).—Cicero.

On January 18, throughout the nation, the 4th War Loan campaign begins. Fourteen billion dollars is the goal that has been set; five and one-half billion of this sum is to be secured from individual purchasers. The physician, as an individual, will be approached through his bank, his clubs, his hospital, his university and medical school and his home. The state and county medical societies may cooperate, if they wish, by making an organized approach to their membership, assigning quotas to individual physicians and establishing special war loan committees to make certain that each physician hears personally of the need for his individual investment in this war loan. No doubt many county and state medical societies will wish to engage in the 4th war loan campaign as an organizational effort; they may welcome speakers to address their sessions. Certainly every leader of American medicine will wish to do the most that he can to aid in achieving the goals that have been established.

One third of the active medical profession have sought and accepted commissions in the armed forces; the physicians of our country not only "Back the Attack" but also play their part in it. Physicians who remain at home are participating in the war to the limits of their physical strength. They work on Selective Service boards, in the activities of health departments, in civilian defense, in the care of the injured in industry, in the campaigns against epidemics and disease. They are maintaining the high tradition of the profession. Since the very nature of their occupation makes difficult an organized approach, such as is made to workers in businesses, industries, trades or other occupational classes, they will quite certainly subscribe as individuals for war bonds to the fullest extent that their finances permit.

To carry on war three things are necessary: money, money, and yet more money.—Trivulzio's message to King Louis XII.

The glorious victories of our troops, wherever they are engaged, give to every American the thrill that comes in greatest measure to those who participate in the victory. The message of General Clark to General Kirk extolling the accomplishments of the medical corps at Salerno, the magnificent statistics of recovery of the wounded, of the prevention and cure of infectious diseases, of health and nutrition arouse a pardonable pride in each of us. The physician's responsibilities as a leader in his community, as a citizen and as a teacher place on him a special responsibility in the nationwide drive for the 4th War Loan. His patients will respect him all the more when he urges on each of them his patriotic duty and when he tells them the extent to which he himself has subscribed. Some years ago in Newark, N. J., when funds were being raised for the building of a hospital, Cardinal Walsh climaxed the appeal, saying "Look into your hearts; think of the most that you can subscribe and then double it!" Our leaders in this 4th War Loan drive have set the quota as "at least one extra \$100 bond for every person with income." The peril of inflation may be met to some extent if even that hundred dollars is siphoned away from the explosive excess purchasing power that now resides in many an American purse.

War is a matter not so much of arms as of expenditure, through which arms may be made of service.—Thucydides.

American production has been a most important factor in the success of the United Nations. We glory in the sufficiency of armament, in the amplitude of nourishment, in the quantity and quality of our medical supplies. Here are a few costs submitted by government sources:

Collecting station equipped to give 600 battle casualties emergency treatment or a mobile surgical unit—a truck equipped to provide special surgical care for serious casualties..	\$ 4,200
Clearing station providing temporary care for the wounded	30,000
Ambulance plane for transportation of seriously wounded	110,000
General hospital of 1,000 beds.....	300,000

As an aid to the bond campaign, organizations which sell \$110,000 worth of bonds within their time limit may name "their" ambulance planes, and groups buying ambulances or an ambulance train have the privilege of placing a plaque on "their" equipment. Thus the hospital at home may have a namesake in service at the front.

The securities for the 4th War Loan are designed to encourage long time investment of savings and current income. Money thus invested serves many objectives; primarily, however, it is the very sinews of war, the weapons and munitions of combat, the food to sustain the fighter, the medical supplies for the care of

the wounded, the clothing and the housing facilities of troops in training and at the front. And as the war moves on to its conclusion in triumph these funds serve not only to "Back the Attack" but to "Bring Them Back."

HUMAN SERUM COMPLEMENT

Ecker and his co-workers¹ of the Institute of Pathology, Western Reserve University, report the fractionation of human serum complement into four essential components. Originally Bordet, Ehrlich and others assumed that "complement" or "alexin" is a single chemical entity, a panimmunizing enzyme that requires specific antibodies for its lytic action. This concept was soon challenged by Ferrata,² who showed that if guinea pig serum was separated into a globulin and albumin fraction neither fraction contained complement but that the original complement titer could be restored by combining the two fractions. Complement thus became an albumin-globulin complex, the terms "end piece" and "mid piece" being applied to the two fractions, so that complement was still conceived to be a single chemical entity.

In 1914 Coca³ suggested that there was a third essential factor in guinea pig complement, which could be specifically absorbed on yeast or on insoluble yeast carbohydrate ("zymosan"). This third component is believed to be a lipid. A fourth essential component was afterward discovered in guinea pig complement,⁴ a heat stable fraction specifically inactivated by dilute ammonium hydroxide or by hydrazine. This fourth component contains a reactive carbonyl group, which presumably accounts for this inactivation.

A simplified terminology⁵ for the four essential components of guinea pig complement is now in general use, the symbols C'1, C'2, C'3 and C'4 being substituted for the "mid piece," "end piece," "third component" and "fourth component" respectively of the older nomenclature. When guinea pig complement exerts its hemolytic, bacteriolytic or bactericidal activity, C'4, C'2 and varying amounts of C'1 combine with the antibody-antigen complex (e. g. sensitized bacteria), the essential enzyme (C'3) remaining unbound. A deficiency of any one of the four factors inactivates guinea pig complement. Thus in the hereditary complement deficiency of certain strains of guinea pigs there is a hereditary lack of C'3, the three other components being apparently normal.⁶ An excess of C'1 in guinea pig serum is anticomplementary.

Applying the same technic to human serum, the Cleveland pathologists found that human complement

also is a complex of at least four essential components, only one of which (C'3) is identical with the homologous factor in guinea pig serum. Another factor (C'1) is mutually interchangeable with the homologous component of cow or sheep serum. In human serum also the bactericidal or hemolytic action is destroyed by inactivation of any one of the four components. Of particular interest is their finding that a serum fraction which contains only C'2, C'3 and C'4 has the power of "fortifying" normal human complement.

Study of human complement variations under pathologic conditions now in progress in the Cleveland laboratory may lead to new or improved serodiagnostic methods or to successful methods of correcting, fortifying or maximizing normal or pathologic human complement. The latter might be of wide clinical interest, particularly in connection with future methods of fractional plasma transfusion.

THE WAR AND THE DISTRIBUTION OF PHYSICIANS

The effect of the war on the distribution of physicians has recently been discussed by Perrott and Davis.¹ These investigators of the United States Public Health Service report a survey of the changes in the medical manpower picture. Moreover, they attempt an estimate of the changes to take place during the next few years.

The war has withdrawn about one third of the active practitioners of medicine in the United States. The rate of decrease in the number of civilian physicians from Jan. 1, 1942 to the present time has been precipitous. There were more than 130,000 active private practitioners on Jan. 1, 1942; there will be only about 85,000 at the end of 1943. The recruiting of practicing physicians has already diminished greatly; the armed forces will obtain additional medical officers from among the graduating medical students. The services expect to take 80 per cent of all medical graduates; the number entering civilian practice will no longer fully replace those who die or retire. Consequently Perrott and Davis predict an annual net loss of about 2,100 for the period following Jan. 1, 1944.

The rate of attrition, the authors predict, will tend to be most severe in the states which were medically poor before the war: these states generally have a high proportion of older graduates and receive an unduly low proportion of new medical graduates. New York, with about 10 per cent of the country's population, receives nearly 18 per cent of the new physicians; Alabama, with about 2 per cent of the population, receives but one third of 1 per cent. Twenty-eight states with a combined population of 54,500,000 are expected to have more than 1,500 persons per physician

1. Perrott, G. St. J., and Davis, B. M.: The War and the Distribution of Physicians, *Pub. Health Rep.* 58: 1545 (Oct. 15) 1943.

1. Ecker, E. E.; Pillemer, L., and Seifter, S.: *J. Immunol.* 47: 181, 195, 211, 221 (Sept.) 1943.

2. Ferrata, A.: *Berl. klin. Wchnschr.* 44: 366, 1907.

3. Coca, A. F.: *Ztschr. f. Immunitätsforsch.* 21: 604, 1914.

4. Gordon, J.; Whitehead, H. R., and Worwall, A.: *Biochem. J.* 20: 1028, 1036, 1926.

5. Pillemer, L., and Ecker, E. E.: *Science* 94: 437 (Nov. 7) 1941.

6. Hyde, R. R.: *J. Immunol.* 8: 267, 1923.

by Jan. 1, 1944, and seven of these states, with 13,500,000 population, will have more than 2,000. During the past twenty years² there has been a trend for the states rich in physicians to become richer and for the states poor in physicians to become poorer, largely because of the preference of new graduates to locate in the states which most encourage medical practice.

The analysis by these officers of the United States Public Health Service serves to indicate certain aspects of the distribution of physicians, to which attention may well be directed in postwar planning for medical services. The situation described need not necessarily demand a revolution in medical education or medical practice for its correction. Improvement in the supply of hospital and laboratory facilities may promptly have a salutary effect.

Current Comment

A REMARKABLE EPIDEMIC OF INFECTIOUS MONONUCLEOSIS

Halerow, Owen and Rodger¹ describe an outbreak of infectious mononucleosis with unusual features in a hospital and surrounding districts in August 1942. Among a selected population, mainly young soldiers, the main age incidence of the disease concerned those from 20 to 45 years of age; the incubation period seemed to vary from five to ten days. Efforts to trace case to case transmission did not give satisfactory results. On August 5 a woman aged 25 was admitted to the hospital with a typical attack. In a few days 4 other patients were admitted. Soon a physician who had taken care of the first patient, then other members of the medical and surgical staffs and many patients in the hospital contracted the disease. Now a special study was made of all the other patients and members of the medical and nursing staffs, in all 296 persons, of whom 290 presented evidences of infection either clinical (125) or hematoserologic without clinical manifestations (165). The hospital was closed to new patients on August 25. Relatives of the staffs living outside the hospital also presented clinical evidences of mononucleosis, and studies of people in the vicinity revealed many cases of latent or mild infection; but of 20 persons living 35 miles distant, none had clinical or hematoserologic indications of the disease. These and other facts are interpreted as indicating a well localized epidemic of a mild form of mononucleosis of unusual infectivity. White blood counts and tests of the serum for heterophilic antibody (agglutinin for sheep corpuscles) gave results of decisive significance in these studies. In the absence of such tests the cases outside the hospital undoubtedly would have been

"regarded as influenza, gastroenteritis, etc." In view of the reports of false positive tests for syphilis in infectious mononucleosis, tests for syphilis were made in many of the cases in the hospital; the results were uniformly negative. The other unusual features of the epidemic are the extensive infection in adults and the frequent hematoserologic evidences of infectious mononucleosis without any of the usual clinical manifestations.

DYSGERMINOMA OF THE TESTIS

Dysgerminoma (seminoma) is the most common tumor of the testis. In nature and structure it is a cellular, undifferentiated carcinoma arising from cells in the testicular tubules. The tumor occurs most frequently in the fourth decade; its growth may be rapid or slow. Metastasis, mostly in the abdomino-aortic lymph nodes, followed later by generalization, may occur early, sometimes even before the primary growth is detected. The best treatment of testicular cancer at present seems to be orchiectomy as promptly as possible, even if metastasis has occurred, followed by radiotherapy directed against possible or actual metastasis. The effect of proper roentgen treatment on metastases of dysgerminoma may be so prompt as to have diagnostic significance. The results of orchiectomy and radiotherapy in 103 cases of dysgerminoma treated at the Mayo Clinic under fairly uniform conditions are noteworthy.¹ Of the patients who received roentgen treatment "71.1 per cent lived five or more years. Of those patients who did not receive roentgen treatment the survival rate was 58.8 per cent for the same length of time." Other forms of testicular cancer treated in the same general way did not do by far so well. The demonstration that the metastases of this tumor are susceptible to the roentgen ray marks an advance in the radiotherapy of cancer. As in other forms of curable cancer, early diagnosis and prompt treatment in competent hands hold out the best hope for the cure of dysgerminoma of the testis.

BENJAMIN FRANKLIN'S CONTRIBUTION TO MEDICAL SCIENCE

On January 17 the nation will celebrate the 238th anniversary of the birth of Benjamin Franklin. One of the least known facets of Franklin's multisided nature was his interest in medical science. Although lacking formal medical education, Franklin made important investigations on the common cold and on lead poisoning. Franklin was actively interested in inoculation against smallpox, in debunking mesmerism, in optometry, in heart action and in medical instruments. In view of Franklin's activities in so many other fields of knowledge, it is not surprising that he should have been attracted to medicine and that his genius was apparent there as elsewhere.

2. Mountin, J. W.; Pennell, E. H., and Nicolay, Virginia: Location and Movement of Physicians, 1923 and 1938: Turnover as a Factor Affecting State Totals, *Pub. Health Rep.* 57:1752 (Nov. 20) 1942.

1. Halerow, J. P. A.; Owen, L. M., and Rodger, N. O.: Infectious Mononucleosis with an Account of an Epidemic in an F. M. S. Hospital, *Brit. M. J.* 2:443 (Oct. 9) 1943.

1. Cabot, Hugh, and Berkson, Joseph: Neoplasms of the Testis; Study of the Results of Orchidectomy, With or Without Irradiation, *New England J. Med.* 220:192 (Feb. 2) 1939. Nash, L. A., and Leddy, E. T.: Seminoma of the Testis from the Standpoint of Roentgen Treatment, *Am. J. Roentgenol.* 50:162 (Aug.) 1943.

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeons General of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war, and such other information and announcements as will be useful to the medical profession.

ARMY

NEW POLICIES GOVERNING DISCHARGES FROM THE ARMED FORCES

The War Department in regulations dated Dec. 15, 1943 has changed the regulations issued in November 1942 regarding discharges from military service, particularly as they relate to tuberculosis, neuropsychiatric disorders and malaria. The new regulations are as follows:

(1) No individual with a disability incurred in line of duty will be discharged on certificate of disability until definitive treatment has been completed, except those having tuberculosis or neuropsychiatric disorders. Types of cases which should be retained for treatment include those requiring skin graft, bone graft, revision of amputation stumps, closure of colostomy, etc.

(2) Individuals unfit for Army service because of neuropsychiatric disturbances will not be retained for definitive treatment but will be discharged, and arrangements will be made for further care by the Veterans' Administration if such is indicated. Exceptions are those individuals with neuropsychiatric conditions incurred incident to the service who, in the opinion of the medical officer, may within a reasonable period be returned to duty within the continental limits of the United States.

(3) Enlisted personnel developing tuberculosis, unless terminal cases, will be transferred to Veterans' Administration facilities and discharged as soon as a definite diagnosis of tuberculosis and disablement for further military service are determined. Exception to this policy may be made in the case of personnel nearing completion of twenty years' service and noncommissioned officers of the first three grades when the prognosis is favorable for a complete recovery and restoration to duty within one year. Such individuals will be transferred to Fitzsimons General Hospital, or other designated Army hospital, for treatment.

(4) Terminal cases and those in which such transfer will endanger the patient's life or recovery will be retained in the service and hospitalized until death ensues or transfer to a Veterans' Administration facility becomes possible.

(5) Individuals will not be separated from the military service solely because of malaria, in the absence of permanently incapacitating residuals or sequelae such as marked splenomegaly or cachexia. Repeated relapses alone will not constitute a cause for separation.

(6) When the enlisted man is to be separated from the service on certificate of disability for discharge, irrespective of line of duty status, and further hospitalization is necessary, he will be transferred to a Veterans' Administration facility and will be discharged.

MANAGEMENT OF CONVALESCENCE FROM MALARIA

Circular Letter No. 197 concerns the management of convalescence from malaria and was issued by the Office of the Surgeon General, Washington, D. C., December 27. Otherwise healthy persons quickly recover from isolated attacks of malaria, and a convalescent period of two weeks is considered ample during which time sufficient rest, a well planned diet and pro-

gressively increasing activity, are usually the only measures necessary. Only when anemia is present is iron required. Patients who have had short intervals between a long series of attacks of malaria sometimes remain depressed and in a debilitated state for an excessively long time. Steps should be taken to aid convalescence in this group of cases. Diets should be planned to be attractive, appetizing and palatable in addition to containing the essential nutrients. Vitamin supplements such as cod liver oil and dried yeast tablets may be taken. The patient should enter a reconditioning program as soon as his condition permits. Activities should be both recreational and useful and should hold the patient's interest and keep him busy, mentally and physically. Boredom or undue fatigue should not be permitted, and the sense of usefulness and responsibility should be aroused and developed.

THE 297TH GENERAL HOSPITAL

The 297th General Hospital, at Banning, Calif., is composed of an affiliated unit from the Cook County Hospital, Chicago. The unit was activated June 10, 1943 at Temple, Texas, arrived at Banning on September 30 and has been established in the theater of operations type buildings with a bed capacity of 1,063. In addition to the usual x-ray service and clinical laboratory facilities the hospital is equipped with a physical therapy department and with basal metabolism and electrocardiographic laboratories. All types of disease or injury incurred by military personnel are admitted to this institution. Col. Francis W. Pruitt is commanding officer, and Major Gordon E. Snyder is executive officer. Other medical officers on the staff are as follows:

MEDICAL SERVICE

Lieut. Col. George F. O'Brien, chief of medical service.	Capt. John L. Bohan.
Major Max Kaplan, assistant chief of medical service.	Capt. John V. Burke.
Major Melvin L. Afremow.	Capt. Charles J. Hillenbrand.
Major John Ashworth.	Capt. Lawrence A. Levitt.
Major Paul L. Bedinger.	Capt. Robert O. Levitt.
Major Emmett D. Wall.	Capt. James W. Pick.
	Capt. Leonard J. Trilling.
	Capt. John S. Zelenik.

SURGICAL SERVICE

Lieut. Col. Chester C. Guy, chief of surgical service.	Capt. Eugene A. Hamilton.
Major Peter A. Nelson, assistant chief of surgical service.	Capt. Frederick J. Leemann.
Major William C. Beck.	Capt. Francis A. Napolilli.
Major Wesley A. Gustafson.	Capt. Henry T. Oleck.
Major Hampar Kelikian.	Capt. Carl K. Solander.
Major Richard A. Perritt.	Capt. William B. Sullivan.
Major John J. Walsh.	Capt. Malcolm C. Todd.
Capt. Nicholas J. Capos.	Capt. Herbert L. Udesky.
	1st Lieut. Edmund R. Donoghue.
	1st Lieut. William H. Walters.

DENTAL SERVICE

Lieut. Col. Joseph L. Uhl, D. C., chief of dental service.	Capt. John B. Davis, D. C.
Capt. Irwin J. Altheim, D. C.	Capt. Wesley M. Kirtz, D. C.
	Capt. Leo Stern, D. C.

LABORATORY SERVICE

Lieut. Col. Alex B. Ragins chief of laboratory service.

X-RAY SERVICE

Major Elbert K. Lewis, chief of x-ray service.	Capt. George W. Smith Jr.
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**CAPT. MORGAN K. ADAMS RECEIVES
SILVER STAR AWARD**

Capt. Morgan K. Adams, formerly of San Bernardino, Calif., has been awarded the Silver Star for gallantry in action during August 1943. The citation accompanying the award read as follows: "In the vicinity of . . . , Sicily, Captain Adams, Battalion Surgeon, being summoned to attend wounded soldiers in a forward area, subjected to heavy enemy artillery fire all the while, did, with total disregard for his own personal safety, and with shell fragments flying in his immediate vicinity, go to the aid of wounded, administer aid, and evacuate wounded to the rear. Captain Adams's prompt action was instrumental in saving the lives of many injured and reflects great credit on himself and the military service." Dr. Adams graduated from the College of Medical Evangelists, Loma-Linda, Calif., in 1939 and entered the service Nov. 1, 1940.

**TWENTY-EIGHTH CLASS OF MEDICAL
ADMINISTRATIVE CORPS OFFICERS**

The twenty-eighth class of Medical Administrative Corps Officers at the Officer Candidate School, Camp Barkeley, Texas, graduated on December 29. The course was of four months' duration and included medical administration, supply, organization of the army, sanitation, first aid, chemical warfare, tactics, training and logistics. Each candidate was given the opportunity to prove his ability to command troops during the course, and acting company and platoon officers and noncommissioned officers were chosen from the ranks twice each week. Brig. Gen. Roy C. Heflebower, commandant of the school, delivered the graduating address and Capt. Willard E. Thompson, executive officer, administered the oath of office.

ARMY NEWS BRIEFS

A medical history of the war, recording in photographs and drawings new surgical technic and unusual treatment of disease, is being compiled by members of the Museum and Medical Arts Service of the Army Medical Corps in the European theater of operations.

Sergt. Joseph G. Nalepovic, Silver Spring, Md., recently photographed a simplified method of applying plaster casts in the field. He made a series of twelve pictures in which the various stages of preparing and applying the plaster were demonstrated.

Drawings of a case of coloboma were made by Sergt. Clifton B. Potter, Beverly, Mass.

Capt. Ralph D. Reed, Bethesda, Md., formerly a bacteriologist with the United States Public Health Service, with the aid of three photographers and two medical artists has set up an "art gallery" and dark room. He and his staff take motion pictures of any operation or treatment which is valuable for future study by army doctors. Other members of the unit are Sergt. Robert C. Adams Jr., Lumberton, N. C.; Sergt. Howard L. Cradick, Indianapolis, and Corp. Howard Francis, Ridley Park, Pa.

THE RHOADS GENERAL HOSPITAL

The Rhoads General Hospital, Utica, N. Y., was formally dedicated on Oct. 30, 1943. The dedicatory address was delivered by Hon. James M. Mead, United States Senator of the state of New York. At this ceremony the commanding officer of the Rhoads General Hospital, Col. Austin J. Canning, was awarded the Legion of Merit for exceptionally meritorious service during the attack on Pearl Harbor, Dec. 7, 1941.

The Rhoads General Hospital is the standard cantonment type being used by the army during the present war and was named in honor of the late Col. Thomas Leidy Rhoads, who served with distinction in the Medical Corps of the United States Army for more than thirty years, and who served as the personal physician to Presidents Taft and Wilson. For his service in France during the first world war he was awarded the Distinguished Service Medal.

**STUDY REQUIREMENTS OF PERSONNEL
FOR ADMISSION INTO THE
ARMED FORCES**

The following physicians were appointed by the President as members of a commission to study and report on the requirements of personnel for admission into the armed service:

Rear Admiral Ross T. McIntire, Surgeon General of the Navy, Washington, D. C.
Major General Norman Kirk, Surgeon General of the Army, Washington, D. C.
Dr. Alan C. Woods, ophthalmologist in chief, Johns Hopkins Hospital, Baltimore.
Dr. Frank H. Lahey, surgeon in chief, Lahey Clinic, Boston.
Dr. Edward A. Strecker, professor of psychiatry, University of Pennsylvania, West Philadelphia, Pa.

**BRIG. GEN. LEON A. FOX AWARDED
DISTINGUISHED SERVICE MEDAL**

Brig. Gen. Leon A. Fox was awarded the Distinguished Service Medal for "exceptionally meritorious and distinguished service in a position of great responsibility while serving as Health Director for the Caribbean and North Atlantic Engineer Division from Nov. 30, 1940 to Dec. 15, 1942. During this period, in addition to his normal duties as division health director, General Fox was charged with carrying out a health program of great magnitude in connection with construction work in the Caribbean bases, northern ferry routes, ferry routes across Africa, Pan American highway, northwest division, and foreign missions located in Africa, Iran and Iraq. Throughout, General Fox has demonstrated great foresight, energy, organizing ability and inspiring leadership, which have contributed in large part to the successful prosecution of these important projects." Dr. Fox graduated from the University of Cincinnati College of Medicine in 1912, and after serving in the Alabama National Guard he was commissioned in the regular army of the United States. He has also been awarded the Legion of Merit for exceptionally meritorious service as chief health officer, Caribbean Division, Caribbean Defense Command.

**MAJOR NATHAN H. WEXLER RECEIVES
SOLDIER'S MEDAL**

Major Nathan H. Wexler, formerly of Brooklyn and now flight surgeon in a P-38 "The Lightning" fighter unit somewhere in New Guinea, was awarded the Soldier's Medal for "his courageous actions in the caring for wounded personnel during one of the most severe enemy air raids in this theater. This service on his part, in addition to his regular duties of keeping positive check on the physical and mental well-being of every member of his outfit, has earned for him the sincerity of respect of this entire unit." Dr. Wexler graduated from New York University College of Medicine, New York, in 1932 and entered the service in January 1942.

AWARDED LEGION OF MERIT MEDAL

Capt. Oscar L. Entin, formerly of Chicago, was recently awarded the Legion of Merit medal for leading a rescue party through the French Guinea jungle last spring to the wreckage of a plane piloted by Lieut. Tommy Harmon, former All American football player. The citation accompanying the award read as follows: "With no advance notice and less than a half hour wherein to make preparations, Entin accepted the responsibility and carried it through to a successful conclusion, recovering the bodies of all except one member of the airplane's crew and obtaining information helpful in determining the nature of the accident." Dr. Entin graduated from Loyola University School of Medicine, Chicago, in 1936 and entered the service Nov. 20, 1941.

ARMY PERSONAL

The honorary degree of doctor of science was conferred on Brig. Gen. James Stevens Simmons, U. S. Army, chief of the Preventive Medicine Service, Office of the Surgeon General, by the University of Pennsylvania, December 22.

PROCUREMENT AND ASSIGNMENT SERVICE FOR PHYSICIANS, DENTISTS AND VETERINARIANS

PHYSICIANS SUBJECT TO EMPLOYMENT STABILIZATION PROGRAM

The War Manpower Commission has recently announced that physicians, dentists, veterinarians, sanitary engineers and nurses who are salaried employees in essential or locally needed activities are hereafter subject to the same provisions of any employment stabilization program as applies to other workers in such activities. Such professional employees may not change their jobs without securing statements of availability from the United States Employment Service or being referred to new jobs by this service. The Employment Service, however, it was emphasized, will make referrals of such employees only after consulting the state chairman of the Procurement and Assignment Service. This procedure, it was explained, will insure referral of these professional workers to jobs in which they can make their most effective contributions to the war effort. On approval of the regional war manpower director, any state director may delegate the duty of referring such employees to new jobs to the state and local offices of the Procurement and Assignment Service.

ARMY AND NAVY DENTAL CORPS

According to C. Willard Camalier, D.D.S., of Washington, D. C., chairman of the American Dental Association's war service committee, 800 more civilian dentists will be drawn from the home front for duty with the Army Dental Corps, and another 1,000 men from dental schools will be commissioned to supplement the present corps of 13,000 dental officers. The Navy has 4,000 dental officers, at least 1 assigned to every ship of cruiser class or larger, and to every tender, hospital ship and transport. Army dentists have been provided with portable equipment, collapsible chairs and foot powered drills and portable sterilizers for use close to combat areas. Army dentists in the service now have a record of 4 million cases admitted to treatment last year. They installed more than 7½ million fillings, and during the month of March 1943 extracted 582,546 teeth. In the same month they replaced 456,783 teeth. In a recent month the Navy Dental Corps installed 50,000 fillings and restorations. Dr. Camalier stated that every effort is being made to insure the dental health of the men in the armed services and to save them pain incident to such infections.

HOSPITALS NEEDING INTERNS AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their house staff quotas allotted by the Procurement and Assignment Service:

(Continuation of list in THE JOURNAL, January 1, p. 44)

FLORIDA

Pensacola Hospital, Pensacola. Capacity, 197; admissions, 6,248. Sister Vincent, R.N., Superintendent (interns, residents—mixed).

MICHIGAN

Grace Hospital, Detroit. Capacity, 555; admissions, 16,677. Dr. E. F. Collins, Medical Director (2 interns).

St. Mary's Hospital, Saginaw. Capacity, 387; admissions, 9,429. Sister Electa, R.N., Superintendent (2 interns, 1 resident—mixed).

Saint Joseph's Mercy Hospital, Detroit. Capacity, 225; admissions, 9,500. Sister Mary Camilla, R.N., Superintendent (2 interns and 1 resident—general).

MISSOURI

Christian Hospital, St. Louis. Capacity, 145; admissions, 2,760. Miss Agnes Heman, R.N., Superintendent (residents—mixed).

TEXAS

City-County Hospital, Fort Worth. Capacity, 186; admissions, 5,598. Mr. A. C. Seawell, Administrator (assistant resident).

WISCONSIN

St. Luke's Hospital, Milwaukee. Capacity, 135; admissions, 4,644. Mr. M. E. Knisely, Superintendent (1 intern).

NATIONAL REGISTRATION FOR NURSES POSTPONED

The Directing Board of the Procurement and Assignment Service issued form 328, dated January 1, to state chairmen for nurses, stating that the national registration of nurses planned for the week of February 7 has been postponed indefinitely, owing to circumstances beyond the control of the War Manpower Commission. States are requested not to hold a registration of their own until the status of the national registration is determined. It was also stated that a draft of nurses for military service is not contemplated.

MISCELLANEOUS

MEDICAL AND SURGICAL RELIEF COMMITTEE OF AMERICA

The Medical and Surgical Relief Committee of America, 420 Lexington Avenue, New York City, donated during December 1943 medical equipment valued at \$1,715 to one crashboat squadron and four motor torpedo boat squadrons. The committee's gift is part of a current project that to date has distributed emergency medical kits to more than 900 subchasers, destroyer escorts, gunboats, mine sweepers and patrol boats, in addition to supplying battle dressing station equipment to battleships, cruisers and destroyers. A philanthropic organization dedicated to medical aid for the armed and civilian forces of the United Nations, the Medical and Surgical Relief Committee is conducted by a nationwide group of physicians and surgeons, of which Dr. Joseph P. Hoguet is medical director.

INTER-AMERICAN NURSES TRAINING PROGRAM

The United States is cooperating with eighteen of the other American republics in an inter-American health and sanitation program, which has increased the demand for nurses. Training of additional personnel is being carried out mainly under special inter-American cooperative health services organized in the other American republics. Dr. Janet Welch Mackie, who is with the health and sanitation division of the Institute

of Inter-American Affairs, Washington, D. C., has recently surveyed the nursing needs of the other Americas. She recently returned from Bolivia, where she assisted the Servicio Cooperativo Inter-Americano de Salud Publica in developing a child health and nurses training program. In reporting on the work, Dr. Mackie said "It is realized not only by the medical staffs of the servicios but by the local medical authorities that one of the greatest handicaps to the development of public health activities is the lack of professionally trained nurses, particularly public health nurses. The servicios, therefore, have attempted to promote nursing education to meet the needs as rapidly as possible. The training of public health nurses is a direct requirement to supply personnel for health centers now being established in many places in Latin America."

A fellowship plan for postgraduate study in the United States in nursing administration, public health and nursing education is another phase of the inter-American program. Seven nurses from Brazil, Bolivia and Peru hold one year nursing fellowships for study in the United States.

WARTIME GRADUATE MEDICAL MEETINGS

Comdr. Harry P. Schenck, 1912 Spruce Street, Philadelphia will act as national consultant in otolaryngology for the Wartime Graduate Medical Meetings. At present he is working on the selection of men for the National Faculty in this specialty.

ORGANIZATION SECTION

FORTIETH ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

The sessions of the Congress on Monday, February 14, will be under the auspices of the Council on Medical Education and Hospitals.

At the morning meeting Dr. Ray Lyman Wilbur will present a report for the Council on Medical Education and Hospitals and will preside over a symposium on problems of postwar medical education. The following topics will be included: "The Medical School Program," "Hospital Training of Medical Graduates," "Readjustments of Returning Medical Officers," "The Distribution of Medical Care" and "Postwar Financing of Higher Education." Participants will include Dr. Harold S. Diehl, dean of the Medical Sciences of the University of Minnesota, Dr. Samuel Soskin, medical director and dean of postgraduate education of the Michael Reese Hospital, Chicago, Dr. Wilburt C. Davison, dean of Duke University School of Medicine, Dr. Samuel Proger, professor of clinical medicine, Tufts College Medical School, and Mr. Fred J. Kelly, chief, Division of Higher Education, of the U. S. Office of Education.

The Monday afternoon session will be devoted to discussions of current wartime problems. The Offices of the Surgeons General will be represented. In addition, "Medical Manpower for Civilians" and "Wartime Graduate Training" will be presented by Dr. Harvey B. Stone, vice chairman, Directing Board, Procurement and Assignment Service, and Comdr. Edward L. Artz, M.D., chairman, Wartime Graduate Medical Meetings. On Tuesday, February 15, there will be programs by the Federation of State Medical Boards. The Council on Industrial

Health will hold its Annual Congress on Industrial Health on Tuesday and Wednesday, February 15 and 16.

All meetings will be held in the Palmer House in Chicago. It is urged that all who have not made reservations do so at once.

Complete details of all programs will be published shortly in THE JOURNAL.

THE CHICAGO SESSION

Applications for Hotel Reservations

A list of Chicago hotels, together with the rates for rooms, may be found on advertising page 56 of this issue of THE JOURNAL. With the list may be found an application form that may be used to secure reservations through the Subcommittee on Hotels of the Local Committee on Arrangements. This application form may be clipped and, when it is properly filled in, should be sent at once to Dr. Fred H. Muller, Chairman of the Subcommittee on Hotels, Chicago Association of Commerce, 1 North La Salle Street (23d Floor), Chicago.

Those who expect to attend the annual session of the American Medical Association should send in their applications at the earliest possible time. Applicants for reservations are especially requested to include a second and a third choice in order that good accommodations may be secured if the desired reservation cannot be had at the hotel of preference. It will greatly expedite matters if requests for reservations are addressed directly to Dr. Muller.

ANNUAL CONFERENCE OF SECRETARIES AND EDITORS OF CONSTITUENT STATE MEDICAL ASSOCIATIONS

SECOND SESSION, FRIDAY AFTERNOON

(Concluded from page 112)

The Council on Medical Service and Public Relations of the American Medical Association

DR. LOUIS H. BAUER, Hempstead, N. Y.: If there has ever been a council appointed in the American Medical Association that has aroused interest, it is the Council on Medical Service and Public Relations.

The Council has definite functions which were set up in amendments to the By-Laws. The Council has been under considerable handicap in that it cannot function until its policies are adopted and its organization and functioning approved and until it has a permanent secretary. Dr. G. Lombard Kelly, dean of the Medical School of the University of Virginia, is here and will take over on January 1.

The policies of the Council have been sent to the secretaries of all state societies, to editors of all state journals and to the chairmen of all legislative committees. Our function is not just to oppose hostile legislation. I believe that may be an important function but perhaps an incidental one. We hear criticisms of the American Medical Association and of the American system of medical care to the effect that it does not cover all the people. We have been deluged by statistics on the number of people without adequate medical care, most of these statistics coming from sources which made the statistics fit their arguments. Nevertheless I think we are agreed that there are certain people who perhaps do not have adequate medical care. It makes no difference whether there are 1 million or 30 million people without proper medical care, the aim should be that if there is 1 person without proper care we should endeavor to see that that person gets that care.

The ordinary statement we hear made about the Wagner-Murray-Dingell bill is "You oppose this; what have you to

offer in place of it?" They would like to have us offer amendments to that bill. This I think would be the wrong thing to do. Those amendments would be introduced, but by the time they got through Congress I am afraid we would not recognize our child, and it would then be our bill. We must not be stampeded into offering any set plan. We do have to take time and pains to point out what American medicine has to offer in place of compulsory sickness insurance. To my mind the most important function of the Council is to study and assess all the various systems of medical care which have been proposed and make an effort to evolve something or several things, possibly, that will meet the situation over the country.

I think every member of the Council is much impressed—in fact, I might say almost overwhelmed—with the magnitude of the task which is before us. Every one is taking it in the most conscientious manner. How much we shall be able to accomplish I do not know. If you are expecting us to become ultra-conservative you will be disappointed. If, on the other hand, you expect us to become ultraradical you are going to be disappointed. If you expect us to work miracles overnight you are going to be disappointed, because none of us are miracle workers.

We have approved group hospital insurance. It is estimated that from 12 to 15 million people in the United States have group hospital insurance. Well, that is only about 10 per cent of the population of the United States. I think that is something that must be furthered, and it is up to the doctors to help further it.

We have approved the principle of voluntary medical expense insurance. There are a number of plans which are in vogue, in operation over the country. I believe I am safe in saying that not one of them has been a 100 per cent success. That does not mean that there is anything wrong with the principle. It may mean that we have not yet worked out the proper formula, and that will take time and study. I understand it took forty years to establish life insurance. Nobody would doubt the success of life insurance at present. I do not mean to imply that it is going to take us forty years to work out

voluntary expense insurance, but it is going to take more than two or three years to do it. I think the medical profession itself, the individual doctor, has been a little laggard in his efforts to further plans which have been adopted in his own state. It would be a mistake to think that we can take one plan and make it fit the whole United States. One of the arguments which we have had against compulsory health insurance as well as many other arguments is that we believe no one system is suited to every section and every class of people in the United States; if that is true of the compulsory, it certainly is equally true of the voluntary.

There is a good deal of interest now in industrial medicine. There have been various industrial plans evolved. One of those that we have heard most about is the Kaiser plan. Mr. Kaiser thinks that his plan is the panacea. I asked him how he thought it was going to work in a rural area with perhaps a population of five persons per square mile, and he thinks it will work, but he did not say how. He said he was going to take it into the rural districts of California and find out. I say let him do it and see what he does find out. There were some good points about Mr. Kaiser's plan and others that are not so good. I question in my own mind if it is the answer. In fact, I am sure it is not the answer. It may be the answer for certain mushroom industrial populations such as it is in effect for at the present time.

We have heard about diagnostic centers; we have heard about state aid in reducing the cost of more expensive therapeutic agents. All those things are matters for study and perhaps solution. When we get through I believe we shall find we shall not have one answer but several answers. What will work in California will not necessarily work in Massachusetts, and what will work in an industrial area will not necessarily work in an agricultural area. We may have to have several plans before we get through. The only way you can work out a satisfactory plan for any area is by experiment and gradual evolution and modification. The Council is not in favor of anything revolutionary. We do hope by the time our job is done, if it ever is, and if not some one else will take it over, that we can offer a system of medical care that is in accord with the American tradition of free enterprise and the American standards of excellent medical care.

The Council has been organized with a chairman, a vice chairman and a full time secretary. An executive committee of three has been created, which includes the chairman, the Council member of the Board of Trustees and a third member elected. The executive committee will have such duties as may be delegated to it by the Council itself.

In order to get all the information necessary to study various plans of medical care, and to know what is being proposed in the legislative world, the Council must have certain sources of information. The American Medical Association has had sources of information, and those are being amplified and extended. We shall have perhaps more opportunity in the future to know just what is going on. But you state secretaries have also got to serve as sources of information, particularly with reference to the various plans of medical care which are going on in your vicinity. We feel we have to maintain close contact with the state societies and the county societies. We have asked each state secretary to have the proper body in his organization designate an already existing committee, or in its judgment appoint a new committee, to act in collaboration with the Council in carrying out our activities. Those letters went to every state society; at the present time we have had replies from nineteen. Some of the replies merely acknowledged receipt; some designated committees; some went so far as to give their whole county setup as to how they wanted us to function with the county. One state has resurrected a former system which they had in 1934-1935 and has gone into it with a great deal of detail. That is the state of Indiana. They have here today an outline of their plan. The Council has not yet seen it. We are going to study it tomorrow at our meeting.

The By-Laws stated that we should establish collaboration with the Bureau of Medical Economics, the Department of Public Relations and the Bureau of Legal Medicine and Legislation. Those contacts have been made. Briefly, the Bureau of Medical Economics has been asked and has expressed its

willingness to do the research on many of the economic problems necessary for Council study. That bureau is well equipped to carry on that research. You state secretaries have a job to do in seeing that the Bureau of Medical Economics or our Council is kept informed of what the status is of the medical care situation in your locality. We expect to establish joint bulletins with the Bureau of Legal Medicine and Legislation on legislative matters and to effect a wider distribution and, if possible, a little more frequent distribution of those bulletins, as well as bulletins of our own. We want these to reach the profession. We have also established relations with the Department of Public Relations. We are going to utilize the sources of information which that department has. Our whole effort is to avoid overlapping of the functions of these various bureaus. There is the most cordial relationship among all the bureaus here in the headquarters office, they are out not to obstruct one another but to help one another. We can make use of the various sources of information which may be established in various places. The secretary is being authorized to travel wherever necessary, in the judgment of the Council, where he can make contact with the various agencies and transmit the information from the Council and bring back information to us.

One of our important functions is to disseminate information that we have accumulated. That can be done, of course, through *THE JOURNAL*, *Hygeia*, the various state journals and those counties that have publications; and of course there will be a certain amount of material which should reach the public. That, I believe, to a great extent will be more effective when it is issued locally. Things which are issued nationally get through the various large press organizations but are apt to be pretty much abbreviated by the time they reach the local papers. A great deal can be done by the local units in furthering publicity of any of our aims.

I believe we have to realize that we must sell ourselves to the public as well as to the medical profession. The public is not aware altogether of what the American Medical Association stands for. As Dr. Kretschmer brought out, there is some vocal disapproval of the American Medical Association, but by large the Association stands pretty well. I believe we should endeavor to combat propaganda which is aimed at us and which is distinctly unfair and based on false premises. That can be done only by contacts with the individual physicians, with the individual organizations in their localities and their individual patients. That requires time on the part of the doctor. It is our feeling that this council is merely the center from which information will go out and to which it will return, but that same sort of thing must be done in each state and each county. Each county society must be a bureau of information for the public as to what our principles are and what we actually stand for.

DISCUSSION

DR. R. L. SENSENICH, South Bend, Ind.: The purpose of this method of public relations is "by means of frank discussion, to establish with the groups contacted that friendly relationship which exists between patient and physician in the home, to the end that the best measures may be instituted for the solution of their mutual problems. It is desirable that these friendly contacts be maintained and be not limited to the consideration of possible impending harmful legislation. In times of continuing social adjustments the value of the understanding and support of a friendly lay public cannot be overestimated." That was the background of the Indiana plan. First, it was built on the premise that an effective physician to public contact was lacking. Second, the physician was not sufficiently informed. I regret to say that I think that is true even today. Third, some appraisal was needed covering the whole problem, both from the standpoint of the physician and from the standpoint of the public: What the public really lacked in medical care, if anything, or what it thought it lacked and what it should have and how it could be attained acceptably to both. Fourth, this method would provide a sort of perpetual inventory through which we would know the attitude of those who would influence legislation, not alone individuals but groups, the employees and the employer groups, and all the other social groups. Fifth, it would include the medical societies and their public relations. Sixth, with the better informed profession

more individuals will be in position to lead, to mold public opinion and help in the direction of the development of such plans as are necessary to meet the needs. Seventh, the council now replaces the legislative committee in the plan or organization. Eighth, the project to a great extent should be that of state and county societies. Ninth, the basic policies must be fixed by the House of Delegates of the American Medical Association. Tenth, plans of action should be formed at the national level at this time by this newly created council on which has been placed so much responsibility and from which we expect so much. Eleventh, each state and each county should be permitted the widest latitude in the matter of its organization, provided it proves that in the particular area it is the best method of approach to the public relations problem involved. Twelfth, the plan is workable.

DR. CARL H. McCASKEY, Indianapolis, President Indiana State Medical Association: Dr. Sensenich has given you the history, the background, the reasons for the adoption of the Indiana plan by organizations. What are some of our contacts in Indiana? First, we have this contact with the Indiana Chamber of Commerce. We have close contact in Indiana, through this working plan, with the Hospital Association. We have close contact with the insurance organizations of the state, the Pharmaceutical Association and certain labor groups which are particularly opposed to the plan set out in the Wagner bill. We have the support of the Manufacturers' Association in Indiana, through working out with them of this plan which has been presented to you. This plan gets down to so-called grass roots of the organization of medicine. It gets down to the man who has to buy medical service or who has to be given medical service. You have a chance to educate the public through this plan on the things that American medicine is doing for it.

DR. G. LOMBARD KELLY, Augusta, Ga.: I agree with Dr. Bauer in regard to the stupendous task this committee has. I feel with awe the undertaking ahead. Only my intense interest in organized medicine, selling the medical profession to the public, persuades me to take on the work of secretary of this committee. I would also like to agree with Dr. Bauer on the need of the cooperation from the secretaries and editors, and the medical profession as a whole.

DR. W. H. TOULSON, Baltimore: I would like to ask the committee what attitude it would take toward the National Physicians Committee.

DR. BAUER: The attitude of the committee on that question really came from the House of Delegates. In the policies of the Council which were sent out a statement was placed in them relative to it: "There is no official affiliation between the American Medical Association and the National Physicians Committee. However, since it is the purpose of the National Physicians Committee to enlighten the public concerning contributions which American medicine has made and is making in behalf of the individual and the nation as a whole, it is the opinion of the Council and the medical profession that we will support the activities of the National Physicians Committee and other organizations of like aim." We welcome any help any one can give us. We had statements of policy relative to the Wagner bill from other organizations beside the National Physicians Committee and we welcome their support also. The American Bar Association has come out against it. There are many prominent newspapers in the country which have come out against it. Various church organizations have come out against it. The monthly or weekly organs of the Methodist Church and of the Catholic Church have both come out strongly against it.

DR. VINCENT T. WILLIAMS, Kansas City, Mo.: Is it not true that if you want to reach the grass roots it might be as a matter of constructive suggestion that these folks who work on county bulletins be apprised of what your committee or council is doing, as rapidly as possible?

DR. BAUER: That is true.

DR. WILLIAMS: I believe you made the statement that your council had come out formally endorsing certain prepared plans?

DR. BAUER: No, I did not say that. I said that the council had under consideration these various things and that I thought it would be a mistake for the Council to endorse any plan at the present time, because I don't know of any plan which is 100 per cent satisfactory; but I do think we should study all plans and see if we could evolve something that would be satisfactory. We haven't endorsed any of them as yet.

DR. WILLIAMS: Was it the principle of prepared plans that your Council did endorse?

DR. BAUER: We have not endorsed anything other than what the American Medical Association has already endorsed, namely, the principle of voluntary insurance.

DR. WILLIAMS: May I ask, then, as a constructive suggestion, that the county societies (I believe there are only about one hundred that have bulletins) be put on your mailing list to get some of this information.

DR. BAUER: We have asked all state secretaries to send us the list of any county societies in their state which they wish placed on our mailing list direct and have asked them either to forward the material which we send out to every county society or, if they prefer, to send us the names and addresses of the county societies so that we can make direct contact with them. Some states have already sent in that information; some of them have asked us to make direct contact with the societies; others have asked us to send material so they can send it out. We feel that is a function of the state society to decide how it wants to do it. We are willing to put anybody on the mailing list who is interested. We just want to be sure you are interested. There is no use sending material to a county society if it does not have any active committee. We are only too delighted to place any county society which is interested on our mailing list. That is why we are anxious to get back the replies from these other thirty states, so we can get our mailing list up to date and so everything we send out will reach everybody who is interested in it. It will cover not only state secretaries and other such county secretaries as request it but the legislative committees and the editors of all the state journals, and anyone else who wants to be put on that list can be included.

DR. GEORGE H. KRESS, San Francisco: On October 10 the council of the California Medical Association voted \$5,000 to make a spot survey of California to find out what, if anything, is wrong with medicine. If the survey justifies, the council contemplates the expenditure of some \$30,000 more to see what can be done to rectify conditions.

Reference was made to a lobby in Washington. The council of the California Medical Association saw fit to approve the plan of sending the secretary of the California Public Health League to Washington, where he is now, to make more intimate contacts with the congressmen from California so that the California Medical Association would be in a better position to advocate those legitimate propositions concerning the public health and medicine that may be deemed worthy of support.

Reference was made to the Kaiser plan. You may be interested somewhat in having a brief reference thereto, because many of you are not on the ground and are not familiar with the situation. Some of you may have read Paul deKruif's book "Kaiser Wakes the Doctors." In the Kaiser Foundation plan they did deal with almost 100,000 men. Let's take the figure of 100,000, because figures are so massive when you transpose them into money values that you can make your own deductions and still see why the Kaiser plan in a limited geographic area in the county of Alameda can do the things that presumably have been accomplished. First, the 100,000 men are comparatively good risks, and at \$2 a month per employee, or \$200,000 a month, you have an income of \$2,400,000 a year. Industrial injuries are cared for and paid for from the State Industrial Fund of California to the extent of 40 per cent; add another \$1,000,000. You have then for the Permanente Foundation approximately \$2,000,000 to \$3,000,000. No wonder that Mr. Kaiser, under those conditions, with practically no acquisition expense in the securing of his risks, and with no medical care to families, can set aside \$25,000 to \$50,000 a month in

paying off the expenses incident to the erection of his hospital in the city of Oakland. But when Mr. Kaiser uses that as a basis of analogy and proceeds to say to the people of the United States that on 7 cents a day he can give treatment to families as well as to employees (instead of dealing with one employer with deductions at the source and with practically no acquisition expense, and with perhaps whatever acquisition expense is involved coming from federal funds, and all that done in limited areas instead of over a massive state such as California and dealing with many employers with all kinds of employees); I say that when he tells the people of the United States and the medical profession that he has found the solution to the problem of adequate medical care he is guilty of erroneous thinking and conclusions, as must be evident to any thinking person when the situation is analyzed. Those of you who are interested should read the October issue of *California and Western Medicine*, in which there is a tear-down of Paul deKruif's book and in which the inside story is told. You can get the real facts from the book review that is there given, with the excerpts and comments.

DR. BAUER: That is exactly the type of information which the Council wants. Kaiser thinks his plan is a panacea, and we question it very much. It may be an answer in certain situations, but does it answer for the whole United States? The fact that the Kaiser plan has had such national prominence makes it necessary that we study it and give information to show why it will not work; we can't just ignore it. The people in California are peculiarly well situated to give us information, and we are going to expect California to give us that information. That is why I say this is going to be a two way affair. You people who are on the ground and who are observing the functions of these plans can give us information which we must have before we can stamp any plan as being good, bad or indifferent.

DR. OLIN WEST, Chicago: There is the most encouraging thing I have seen in fifteen years [referring to the Indiana Society's brochure]. I have not had time to read it or study it. I don't know whether I would agree with everything in it or not, but those of you who have a copy of it will see that it is published by the Indiana State Chamber of Commerce. It is well presented. I presume it is being distributed in considerable numbers. This is the first time that I have seen any definite evidence that they have really become interested and are willing to try to help do the job that has got to be done. We made a long, persistent and intensive effort to get organizations of this kind interested in the fact that the first introductory steps toward efforts to establish socialization of medicine, regimentation of the medical profession and political control of medicine in this country indicated that the next step would be to socialize something else, and the next step something else, and to bring about a complete system of federally controlled life in the United States. I am encouraged that we are receiving inquiries here from commercial organizations, from industrial organizations, from civic clubs, from various groups, not only of physicians but of laymen and lay women who are working to see that this legislation, which has been introduced, is defeated. There is a growing interest on the part of men who are interested primarily in business. They are beginning to realize that in every instance in which socialization has been effected in a nation the first step has been to take up some proposal that makes a strong, popular and an even more strong purely sentimental appeal. It has been true in practically every country that now has a system of compulsory sickness insurance. They always start with the mother and the baby, or with the poor, downtrodden and underprivileged. We made a very earnest effort to interest financial groups, commercial groups, organized groups of industrialists and others. They said that was not their function. The work the medical profession has been doing in trying to stave off socialization not only of medicine but complete socialization is now beginning to seep into the minds of business men and of others who prefer to lead their own lives under democratic principles rather than to be politically dominated in every movement they make, from the cradle to the grave.

FRIDAY, NOVEMBER 20—MORNING

DR. JOHN S. BOUSLOG, Denver, Presiding

A paper on "Medical Legislation in Congress," was presented by Mr. J. W. Holloway Jr., Director of the Bureau of Legal Medicine and Legislation of the American Medical Association. He analyzed legislation pending at the time.

DISCUSSION

DR. STANLEY B. WELD, Hartford, Conn.: Has the Barden-LaFollette bill any relationship to the present emergency or is it a permanent affair?

MR. HOLLOWAY: It is permanent.

DR. WELD: Is there being any difficulty found in financing the relocation of physicians, such as you implied there might be, in your remarks?

MR. HOLLOWAY: I did not imply there was. I simply said that this proposal had been made to finance them.

THE CHAIRMAN: There is a lot of legislation in the Congress that we know nothing about.

DR. WALLER S. LEATHERS, Nashville, Tenn.: May I make this statement, Mr. Chairman: I think Mr. Holloway has presented a clear and helpful discussion about this legislation. Any one who has any idea of legislation realizes that the way in which he has done it shows that he is intimately associated with it and has undoubtedly followed the program remarkably well.

THE CHAIRMAN: I agree with you heartily.

The Federal Plan for Providing Obstetric and Pediatric Care for Wives and Infants of Service Men

DR. L. FERNALD FOSTER, Bay City, Mich.: At this time any presentation relative to the U. S. Children's Bureau plan of providing obstetric and pediatric care for the wives and infants of service men can be only one of reporting observations and views as gathered from various physicians throughout the country. Already each state association probably has taken some action relative to this subject, either having accepted the plan as presented, rejected it in toto or accepted it with modifications. A discussion of the plan a year ago, when some uniformity of action might have been developed, would probably have been more apropos. The history and background of the Children's Bureau plan, including the action of the 1943 American Medical Association House of Delegates, is well known and needs no reiteration today. The war-emergency offered a good opportunity for the proponents of the present program to utilize the great interest appeal of maternal and child health for the families of service men. Is this project, embracing a small segment of medical practice, being utilized as a trial balloon for complete federalization of medical practice? Are the proponents of a plan of complete federalized medical care watching the attitude of the medical profession toward this plan in order to determine what their activities shall be, either to make bolder strides toward their totalitarian objective or to retreat from their grandiose scheme?

Many physicians question the sincerity of purpose in this program. In the first place they are suspicious of this measure, which was enacted not as an independent legislative proposal but as an amendment slipped into an important appropriation act. They further suspect sharp practice in the wholesale premature publicizing of the program to the thousands of service men in camps before the matter was even presented to the necessary purveyors of the services, the doctors. Physicians resent the modern method of "legislation by edict" as exemplified in the ruling by the Children's Bureau that payments cannot be made to the service men's wives but shall be made direct to physicians. Many physicians say that the published reports of approval by forty-five states are misleading in that the plan approved was in many instances that of the state health department and not of the medical profession of the state. Many state medical societies have not given approval, and after all it is the private practitioner who must do the work. These physicians feel that no program, no matter how worthy, can be successful if founded on bad faith and lack of mutual trust.

The main objection to the program is expressed in the American Medical Association resolution: payment direct to doctors of medicine. Every one, including the dependents themselves, would favor a program based on allotments to service men's dependents. There appears to be nothing in the law (the brief amendment to the appropriation act) that specifically prohibits payments to service men's families. The present refusal of the Children's Bureau to try such an arrangement is based on a mere legal opinion. In one Midwestern state the program had been accepted and was working well because opportunity was given the doctors to make supplementary arrangements. When a representative of the Children's Bureau heard of these arrangements, the plan was changed immediately and the possibility of supplementary arrangements was deleted. That state has since given its disapproval to the plan.

Further serious objection lies in the fact that the plan does not take into consideration obstetric complications, emergencies and compensation commensurate with care demanding special technical skill. Such lack of consideration would tend to lower the quality of care—which is one of the most serious objections to all schemes of federalized medicine. Considerable objection has also been made to the very meager provisions for pediatric services. The actual need for such a broad program as the present project promises to be is questionable. However, the widespread publicity given the plan has definitely stimulated a big demand. The bait of "something for nothing" is always alluring to the unthinking populace. It is incomprehensible to the average American that his wife and children's free obstetric and pediatric care may lead to complete regimentation of medicine, which in itself may be the entering wedge for the general socialization of the country. Experience has shown in many cases that where the doctor has had the time to explain the implications of this scheme to his patients they prefer to remain private patients instead of becoming charges of the federal government.

Doctors in states which have refused to approve the plan in its present form are concerned over the position of those state medical associations which have endorsed officially the federal program of obstetric and pediatric care. They have established a precedent which is not consistent with their general opposition to complete state medicine. This action by state associations is being utilized to good advantage by representatives of the Children's Bureau in their attempts to influence other states to adopt the program. It has helped to make the stand of some state associations extremely difficult and almost hopeless.

In my own state the House of Delegates took the following action in September 1943:

(a) "Because this plan is a form of state medicine the Michigan State Medical Society refuses to cooperate in any of the provisions of the plan in its present form.

(b) "That until satisfactory adjustments in the program can be made the members of the Michigan State Medical Society are requested to give professional care gratis in order that the wives and children of servicemen may obtain hospital care."

It has been recommended to the U. S. Children's Bureau that payments be made to doctors of medicine through Michigan Medical Service, our voluntary group medical care plan. A poll of our membership has been taken and it indicates that such an arrangement is approved by a great plurality. A special committee is handling negotiations with the Children's Bureau and Michigan Medical Service at the present time.

The feeling of the medical men in Michigan, where Michigan Medical Service covers the state and where, through Michigan Hospital Service, it invokes the services of 98 per cent of our hospitals, and where Michigan Medical Service is the plan of the profession itself, the profession would be willing to have this service purchased; since we are told that the funds must be used to purchase the services, the profession seems willing to have it purchased through their own organization if that will solve the problem, which it probably would do in Michigan if such a plan were acceptable by the Children's Bureau.

Pending the outcome of these negotiations and being cognizant of the many local problems confronting the profession throughout the state, the executive committee of our council has registered the following opinion:

1. An unalterable disapproval of the plan in its present form.

2. That the members individually might properly—as they deem fit—(a) sign the blanks to provide hospital service, giving the professional care gratis, (b) sign the blanks and accept the government fee or (c) decline to participate in the program. In any event the Children's Bureau plan has been so developed, timed and publicized and so administered that the medical profession in almost any position it takes has been placed definitely on the defensive. It must get on the offensive.

In conclusion, the whole subject might be summarized as follows:

1. Every one is desirous of having quality medical service accorded the dependents of our fighting men.

2. The program of the Children's Bureau is definitely one of federalized or state medicine with direct subsidization of physicians.

3. It does not insure quality service.

4. Federal health and medical projects are seldom discontinued after an emergency—this program is probably no exception.

5. The plan gives no assurance of a maintenance of reasonable fees (even if the present fees were considered reasonable).

6. The program is not limited to doctors of medicine.

7. The program could be used as a precedent to extend federal medical care to all branches of medicine and surgery.

8. Complete refusal to cooperate in the plan, even with an offer to render service gratis, might well evoke a criticism of the medical profession.

9. Official acceptance of the plan is a definite approval of federalized medicine.

10. Where participation in the plan seems necessary, might it not be better to make such a participation on an individual basis—not on a basis of official approval by state associations?

DISCUSSION

DR. EDWIN F. DAILY, Washington, D. C.: Dr. Foster states that he dislikes the Children's Bureau "edict" that payments cannot be made to the wives of service men. That is not an edict of the Children's Bureau. The law, as it was passed, was given to the solicitor of the Department of Labor, and we asked his interpretation as to its intent in this respect: At that time we were told that the wording of the act was "to provide medical, nursing and hospital care" and that it was not the intent of Congress that it be a benefit payment but that the funds were to be used actually to purchase medical and hospital care. The solicitor of the U. S. Department of Labor in a formal opinion dated Dec. 12, 1943 advised as follows: "It is my opinion that the chief of the Children's Bureau has no authority to approve state plans which provide cash allowances to the wives of enlisted men in lieu of the existing method of making payment, through the state health agencies, directly to cooperating practitioners and hospitals."

Further, when additional appropriations were being considered by Congress within the past two or three months an amendment was proposed by a Congressman specifically to provide for a benefit payment instead of purchasing care directly from the doctors and the hospitals. This amendment was defeated, as mentioned by Mr. Holloway. We are now acting in accordance with the law, and I think the position of the Children's Bureau is quite clear.

One minor point in Dr. Foster's statement: He speaks of the director of maternal and child health in the state department of health as being the representative of the Children's Bureau. The directors of maternal and child health in a state are employees of the state health department and are in no way responsible to the Children's Bureau. We have no employees of the Children's Bureau who are working in the states. We have a small staff of regional consultants who act in an advisory capacity.

Dr. Foster made a statement about a physician from Iowa, a member of our advisory committee, who made a statement before the Michigan State Medical Society concerning supplementary payments to the physicians. I had a letter from Dr. Plass in Iowa regretting that he had been misinformed when he went to Michigan, and when he returned to Iowa he found the statement he made was incorrect.

The statement was made here that the plan does not take into consideration any emergencies or any need for any other conditions that may arise during pregnancy. All state plans do provide for medical consultation, and general practitioners can call in a consultant in any specialty whatsoever when one is needed. If he needs a surgeon for an appendectomy, if a general practitioner needs an obstetrician to come in and advise and assist him, all of the plans make provision for any service that the individual needs. If the patient needs hospital care for any complication during pregnancy, provision is made for that. The plan provides for any type of service the individual needs, of course, that is, when that service is or can be made available within the community.

A few more words about the benefit payment: There has been an enormous amount of discussion pro and con as to whether or not it should be a benefit payment to the families or whether the plan should be used to purchase care directly from the doctors and the hospitals.

I think it should be understood that a benefit payment would be unquestionably on a uniform basis, a certain amount—\$50, \$75 or \$100—whatever might be established by Congress as a uniform benefit. One Congressman estimated that the cost of the program would be at least double what it is at the present time since every enlisted man's wife who is pregnant or who has a child under 1 year of age would undoubtedly request and receive the benefit. At present we estimate that only approximately half of the enlisted men's wives who might request this care are applying for such care under the program.

A benefit plan would not take into consideration the great variation in need of individual maternity patients for care. All the states have found that the cost of care between individual cases varies tremendously. Here is Mrs. Jones, who will require perhaps two or three weeks of hospital care in the middle of her pregnancy, for some complication. Perhaps there will be need for prolonged hospital care at the time of childbirth. Those are provided for in the plan. Perhaps consultation is needed, which may run the cost up quite a bit for a certain case. Or maybe the wife has a prematurely born infant who has to stay in the hospital for six or seven weeks. Those variations can be taken into consideration under the present plan and are being taken into consideration. On a benefit payment basis that would not be true. Under a benefit payment plan there could be no assurance that the funds paid to the individual would be used for medical and hospital care, there would be no assurance that the doctors would be paid or that the hospitals would be paid.

All the medical service plans that I know of in this country which are sponsored by the state medical societies provide for payments directly to the doctor, and under the hospital service plans they provide for payments to the hospital. I believe in the history of that type of medical or hospital service plan in this country the principle of payment of a benefit has long been discarded as not practical. Perhaps some of those present here who are familiar with those plans will verify that statement or correct it. In studying some of these plans recently I find that the medical service plans of the state medical societies usually set an annual income of \$2,000, \$2,400 or \$3,000, or something like that for the low income group who are covered by the plans. They establish a fixed payment to physicians which ranges between \$40 and \$60 for maternity care; that constitutes the sole payment to doctors for the service they rendered under the plan, which I believe is somewhat comparable to the provision that has been made under the E. M. I. C. program.

DR. W. W. BAUER, Chicago: I have been a member of the Advisory Committee to the United States Children's Bureau since the committee was established. I should like to make it clear just what the status is of that advisory committee. As its name indicates, it is advisory and nothing more. The medical profession, that is, the American Medical Association, was not asked to appoint a representative. There was correspondence requesting the Association to suggest a member for the Advisory Committee, but not as an official representative of the Association. The Secretary of Labor invited me to be a member. I submitted that invitation to the Board of Trustees, and the Board of Trustees approved acceptance of it. That invitation has twice been renewed, each time for a three year period,

and each time has been accepted in the same manner. This committee has no authority whatsoever. The decision as to the policies of the Children's Bureau rests with the bureau and can be influenced by the committee only as far as the Children's Bureau finds the advice of the committee acceptable. That fact has given rise to an increasing feeling among the members of the committee that there is something inadequate in the relationship. At the last meeting of the U. S. Children's Bureau Advisory Committee, which was held in Washington on October 21, that feeling was definitely expressed by members of the committee in a statement in the more or less informal discussion, to the effect that the representatives on the committee did not truly represent the practicing physician.

I quite frankly admitted that as one who has not practiced medicine for twenty years I was perhaps somewhat remote from the problems of the practicing physician. Other medical representatives on the committee, including full time professors in medical schools and men and women engaged in public health work, freely acknowledged the same. Out of that discussion there came a recommendation from the Advisory Committee to the Children's Bureau that additional representatives be invited and that these representatives be men or women actually in the practice of medicine and acquainted with its problems. This has since been done (THE JOURNAL, January 1, p. 46).

I presented at this advisory committee meeting the resolution of the House of Delegates calling for direct payments to the recipients of medical care and permitting them to make their own arrangements. Many of the members of the committee, particularly those engaged in social work, disagreed with me and presented their arguments to the contrary much as Dr. Daily has presented them, to the effect that this method has been found unsatisfactory, that there is no assurance that the money will be used for the purposes intended, and so on.

The Children's Bureau, as Dr. Daily has stated here, took the position that it is obligated by implication, at least, by the defeat of that amendment to which Mr. Holloway referred, to furnish medical care and to pay the doctor direct, and not to follow the recommendations of the American Medical Association House of Delegates. There was no point in any further debate because we had stated our case; to all intents and purposes it had been rejected, and it stands rejected today.

The other principal thing that came out of that advisory committee meeting, which by the way was a very long, intense and spirited meeting, was the discussion of this question as to whether the act intended to provide maternity care for the wives of service men or to provide medical care for the wives of service men when pregnant, those being two distinct things. I gathered the impression that the interpretation of the officials of the Children's Bureau was that these wives, when pregnant, should have what care they needed, obstetric or other. There was some discussion of the question of dental care, and that was excluded because of the insufficiency of funds, although it was stated as a desirable objective.

On this question of whether women were to have all medical care during pregnancy, or maternity care under this plan, plus making their own arrangements for any additional care, there was quite a long discussion, and a compromise recommendation was arrived at. It was not wholly satisfactory to anybody, I believe, but it appeared to be the best on which agreement could be reached at that time. It was recommended to the Children's Bureau that for intercurrent disease occurring during the pregnancy the physician was to receive additional compensation under certain conditions, the principal one being that the disease must be of a duration longer than seven days. That was an administrative problem, some arbitrary line having to be drawn somewhere. As I say, that was a compromise that was not wholly satisfactory to anybody.

Dr. Foster raised the point that this program is a precedent. I don't think there is the slightest doubt of that. I have had many frank conversations and discussions both with Dr. Eliot and Dr. Daily. Dr. Eliot told me at Washington not so long ago, when I said that the doctors would be better satisfied to cooperate in this plan if they could be assured that it is not the opening wedge for broader plans, "I don't think they can have any such assurance." She may have been expressing her own opinion, or she may have been expressing her estimate of the trend of events.

The American Public Health Association had a meeting in New York early in October, this program being the subject of one session, at which time it was presented by a director of child health and maternal health for a Southern state—I think it was North Carolina—and by a county health officer in that state actually administering the plan, and by Dr. Eliot. Dr. Eliot's discussion was purely a technical discussion of administrative problems and difficulties.

The county health officer emphasized several times that this is a plan for the duration. So also did the state maternal and child health director. The first discussor was Dr. James MacIntosh, a Scottish physician, who opened his discussion with this remark: "I have heard it emphasized here twice that this is a program for the duration." Then he smiled and said "Is it, or have you got your foot in the door?" I think he went straight to the heart of the question.

This program began from small beginnings. Under the general social security grants the Children's Bureau and the Washington State Health Department started this program. From there it went to other states and finally was extended, as Mr. Holloway has pointed out, to almost all the states. Now it is established in practically all the states. Where it will go from here I do not believe we have any assurance, but I think it is logical to assume that if the officials of the Children's Bureau are committed to the conviction that this is a program that they ought to further they will carry it as far as they can get authorization and funds to carry it and will extend it from there. That would be the only logical program that we could impute to individuals who are acting sincerely under their convictions.

As a member of the Children's Bureau committee, I have objected on a number of occasions to the officials of the Children's Bureau because they have not laid their plans before the medical profession. This meeting of October 21 is being started by the Children's Bureau. I received the report yesterday. It will be published soon in an issue of *THE JOURNAL*. Previous meetings, in spite of my repeated requests, have not been adequately reported. As an invited member of that committee I cannot publicize those meetings on my own initiative. The announcements should come from the Children's Bureau. I have asked again and again that they be furnished. Some of them have been furnished, but they have not been furnished in nearly the detail or nearly as early as I think would have been advisable for the information of the medical profession.

Let me emphasize again that we on the Advisory Committee are purely advisory. In fact, at the first meeting of the Advisory Committee before which this program was discussed, we were requested to discuss it, to present our individual opinions, but not to offer any resolutions of the committee or any recommendations of the committee as a whole. I don't know why that request was made; I merely state the fact. And of course that was then all that could be done.

One thing which impressed me in the discussions, both in the Advisory Committee, in private conversation with Dr. Dailey and Dr. Eliot, and with physicians and secretaries of medical societies, is the enormous complexity of the administration of even a fractional medical care plan like this. What must then be the complexities and the difficulties that would be involved in a complete federalization of medical care?

DR. LOUIS H. BAUER, Hempstead, N. Y.: Dr. Dailey, I think, heard the resolution which was read here from the American Academy of Pediatrics. I should like to know what the attitude of the Children's Bureau would be toward such a conference between the officials of the Children's Bureau and the various medical organizations mentioned in that resolution and whether they would come into it with an open mind.

DR. DAILEY: I am sorry I can't answer that question. That resolution had not been received in Washington when I left Washington.

DR. M. PIERCE RUCKER, Richmond, Va.: I am beginning to believe that I can't understand the English language. We are told that services cannot be paid for until the application has been signed and approved, and we are led to believe that the service is needed and desired by the service men's wives. I can

interpret acts, and I thought it might be interesting for an obstetrician to tell a few experiences he has had with this plan. In the first place, I would like to preface my remarks by saying that I deem it a privilege to attend the wife of any service man. I have never turned one down, and so far I can furnish free hospitalization, so it will not cost the service man's wife a cent, if it is necessary. I don't like to be put in the position of refusing to attend service men's wives because I don't like the plan or of being called unpatriotic. My experience with the plan is that as soon as you tell a service man's wife "You understand, of course, that you will have to go into a ward?" they put the green slip back in their purse and that's the end of it. She says she doesn't want it, so evidently it isn't meeting the needs that we are led to think it does.

Recently I had an experience to show that you don't really have fair dealing. I had a service man's wife—I didn't know she was a service man's wife until I filled out the birth certificate. I carried her through her pregnancy and attended her in the hospital. They paid me cash, and about six or eight weeks later I got a letter from the father down in Texas enclosing a letter from the state administration, I believe they called it. Anyway, it was from a member of the state board of health. It said "If the doctor will sign the enclosed slip we can get your wife's bill paid." I called up the state board of health and asked whether I should send the man's money back and wait for the money from the government. They said "No; we will write him that we made a mistake." Now this man was a "satisfied customer" until the government interfered.

It doesn't seem, in our neighborhood at least (and there are a lot of camps around us) that they want this attention if you tell them they have to go to a ward, although we will give them the same service in the ward that they would get in a private room. As soon as they hear the word "ward" they fold up the green tickets and put them back in their pocketbooks.

DR. GEORGE H. KRESS, San Francisco: The important things for us to remember are the implications involved in this federal children's program. Ten million men are in military service, and a great majority of them are married. We start then with 20 million citizens, and their fathers and mothers, 40 million more. Also count at least 20 million friends, or a total of 60 to 80 million citizens. And this adult population of the United States is to be educated to what? To accept a mandatory fee table to be in operation from one end of the United States to the other, in which Dr. Edwin Daily representing the Children's Bureau proposed to C. M. A. President Karl Schaupp and me in the office of the State Department of Public Health in San Francisco that the fee should be \$35 to cover antepartum care, confinement care and postpartum care; antepartum care to imply a certain number of visits, Wassermann tests, hemoglobin determinations and urinalyses, with other usual antepartum care; in addition, all necessary confinement care and postpartum service with a visit to mother and child at least six weeks after the birth of the child.

The war may last three, four, five years. In the meantime the people of the United States will be educated to what, as far as this particular line of professional work is concerned? To a fee of \$35, or perhaps in some places \$50, as full and fair compensation. At the conclusion of the war, in the minds of the great majority of citizens, \$35 to \$50 would be a proper fee for all this professional work, covering a period of months, with all its complications as they may arise. It would follow that any physician who would charge more than \$35 or \$50 would be guilty, in the minds of many citizens, of an atrocious, improper act.

In April or May last we held in Portland a meeting of the Pacific States Medical Executives Conference. In our discussion of the maternity-pediatric program the Oregon representatives presented their plan, saying that the money should be paid to the wife and not to the physician. As a member of the reference committee of that conference I sent a copy of our resolution to Dr. John Fitzgibbon, who in turn presented it to the House of Delegates of the American Medical Association, the resolution with minor modifications being adopted by the House in June.

In California we are in full accord with the objective of giving adequate professional care to the wives and infants of

enlisted men. However, the Council of the California Medical Association has voted that it is up to the individual physician to determine what procedure he wishes to observe in this work.

Dr. Edwin Daily, representing the Federal Children's Bureau of Washington, D. C., came to California and gave the C. M. A. Committee on Maternal Care one hour, and then the conference was closed because he had to consult with hospital representatives. In our discussion with Dr. Daily he brought out the fact that the proposed fee was to be \$35 for all of the service already mentioned. I asked Dr. Daily where he had gotten his figures, and he said "From the American Medical Association." I said, "Oh, impossible! They couldn't have given you figures of that kind. I am sure when I go back to my office," I said, "I will be able to find fee schedules passed years ago by component county societies of the California Medical Association in which fees were in excess of \$35 for all of the services you include in your maternity-pediatric program." I did find such schedules, and the fees ranged up to \$500 for complicated obstetric cases. We told Dr. Daily that \$35 for adequate antepartum, confinement and postpartum care was out of the question as far as California was concerned and insisted that the minimum fee should be \$50. Also, as regards California, we would object to the promulgation of the plan unless it was stated in the literature "This program is made possible only through the generous cooperation of the members of the medical profession," and our California State Board of Public Health has been printing such a statement on its literature.

I wrote to Secretary Olin West and asked him concerning the statement by Dr. Daily that in more than three hundred fee bills that had been obtained from the American Medical Association, every such schedule was \$35 or less. Dr. West was unable to find in the files of the Association any record of any such information having been sent to the federal Children's Bureau. All that was found was a record, I think in the American Medical Association Bureau of Medical Economics, of one discharged employee who may have sent such information to Washington. Then I corresponded with Dr. Daily, and from Dr. Daily I learned that the fee bills that he told us were the authoritative fee-bills of the American Medical Association had been received by the bureau as photostatic copies from the files of the United States Public Health Service, the same being all the way from five to seven years old or more. Yet the federal Children's Bureau saw fit to have its representative go across the country with only that kind of authority in back of it, using the same with committees and representatives of constituent state associations and urging them to abide by their program under the exigencies which are now confronting us in a time of war.

On one other point, I think I am correct in my memory, and Dr. Daily can correct me if I am in error. At one point I said "Dr. Daily, suppose the case is a difficult one, say, a difficult forceps case or a cesarean section. What would be the compensation for the specialist obstetrician?" And I think Dr. Daily told us in the beginning that it had to come from the general practitioner's fee. To that we strenuously objected, and Dr. Daily then stated he would be willing that there should be an additional fee up to \$50 for this specialist care, and that he would so recommend, presumably to the federal Children's Bureau.

Of course, we were anything but happy to think that the American Medical Association should not have entered the picture at the very beginning, when the program was got under way by the federal Children's Bureau. That was one reason why an editorial appeared in *California and Western Medicine* for which we were criticized in *THE JOURNAL*. We retract nothing from what we stated in our official journal. We think we were right then. It seems to us that when this program with its extensive implications was being formulated, that somewhere, somehow, our good friends here at 535 North Dearborn Street in Chicago should have got into the picture, should have been back there in conference with the inside executive group of the Children's Bureau and have helped guide it in its course of action. We also felt bad to think that our good friend Morris Fishbein failed to call this program, with its serious implications, to our attention, editorially. We felt he should have given us something over and above what

appeared in little memorandum statements and news items concerning the progress of these Children's Bureau negotiations.

Our Council of the California Medical Association has voted as follows: The Council approved the plan of adequate service and all possible care to the wives of enlisted men and told the members of the California Medical Association that it was up to them individually to do as they deemed best in the premises; calling their attention to the fact that if they signed on the dotted line they would receive \$50, not one penny more, nor could they receive one penny more directly or indirectly for the services rendered. If, however, they did not choose to sign, and if the patient did desire to become a private patient, well and good. However, in order to make available the hospital care to these wives, the patient could still obtain the hospital costs from the California State Board of Public Health if the physicians themselves would refuse to accept any money for their services—in other words, give gratuitous professional service to these patients. That is the program we are following at the present time, and I take it that it will be the program we shall continue to carry on.

It seems to me that all of this discussion of costs involved, or the saving of money to the government, by asking physicians to give services below cost, is beside the major point. We are involved here with great principles and, as has been stated by Dr. Bauer, this maternity-pediatric program may be the foot inside the door on behalf of state medicine; and with all deference to the officials of the Children's Bureau, the statements which have been made today indicate that such a thought is not without justification. Permit me to cite an example to show how governmental departments sometimes work: Yesterday afternoon Mr. Holloway and I drafted a series of telegrams to California representatives in Congress relative to a bill dealing with migrant agricultural workers. Out in California the migratory agricultural situation has been a very big problem. With the aid of the California Medical Association, an excellent medical service has been devised, in full cooperation with the government officials. Comes now another governmental agency, the United States Employment Service, with amendments to Public Law 45, which would take away from migratory workers, who do not secure their jobs through the United States Employment Service, the right of medical service for themselves and their families. That is the way governmental bureaus act.

Now, as to the future of the federal Children's Bureau's maternity-pediatric program: The federal Children's Bureau in the beginning evidently miscalculated the number of patients who would come under this act. Witness the initial appropriation of 1 million, with subsequent deficiency appropriations of 4 million and 18 million dollars. These would indicate that there will be other deficiency appropriations needed to carry on this work.

It is, then, up to the members of the medical profession, through the constituent state associations, so to educate their congressmen that when these deficiency bills are presented we shall have a different tally of votes than when only about 125 members of the House of Representatives voted on how the federal money should be paid. I believe if we are alert to our legislative responsibilities, appreciating the implications that are involved in all of this, even the Children's Bureau will be obliged to sit up and take notice in some of these congressional matters. Congress makes the grants in aid, and the monies are then distributed through the agency of the Children's Bureau to the proper constituted authorities in the various commonwealths. In most cases these are the state boards of public health. The state-boards of public health are then called on to administer the act, but if the state boards of public health do not conform to the program outlined by the Children's Bureau they are held up in the usual governmental bureaucratic manner.

I shall be glad to have Dr. Daily discuss some of these other phases rather than the costs. With all the billions and billions of dollars that are being spent for a host of things today, I am but little concerned with whether the Children's Bureau save 5 million or 10 million dollars in this work, all at the expense of the medical profession. But I am terrifically concerned with what will be the end result to medical practice and to the quality and type of medical care and medical service we all believe in, if some of these bureaucratic endeavors are carried too far.

DR. WALTER L. BIERRING, Des Moines, Iowa: As a state health commissioner, I have been in a position to observe some of the administrative difficulties attending the Emergency Maternity and Infant Care program. It is difficult to understand the attitude of the Children's Bureau in determining the administrative plan without previous conference with the professional agencies that are responsible for rendering the service to the wives of enlisted men. This apparent lack of confidence in the practicing physician is evident in the difference in the fees allotted for maternity service ranging from \$35 in some states to \$50 in others. The fee allotted to Iowa was \$35, while in a later arrangement the fee was fixed at \$40 in the adjoining states of Wisconsin and Minnesota and \$50 in Nebraska. There is nothing in the Congressional Appropriation Act that restricts the attending obstetrician from accepting additional fees for the service rendered, but the Children's Bureau requires that he so obligate himself in signing the application. It is claimed that the American doctor cannot be trusted. In the words of the Children's Bureau, "if this were permitted there would be no purpose in the plan." What strange logic. The attending obstetrician may be certified by the American Board of Obstetrics and Gynecology, but if a complication should arise during the pregnancy he is required to call in a consultant whether he is certified or not. While medical fees are fixed, hospitals are allowed \$5.50 a day up to a limit of \$500 for one year and later on a per diem cost basis, which in some instances has been \$7 a day and over. Frequent appeals have been made to have these inequalities corrected without result. There is but one tribunal, and that is always right. Without the fullest cooperation of the practicing physician, no federal plan of medical service can succeed or fulfil the purpose for which it has been established.

DR. MORRIS FISHBEN, Chicago: I would like to refer briefly the attitude of *THE JOURNAL* toward this situation and to make some remarks in extenuation in relation to the various editorial comments that have appeared on the subject in various publications. I would like to emphasize particularly some of the statements made by Dr. Bauer in relation to the technic of operation of those in charge of the Children's Bureau. Obviously the technic they employ to control as far as possible in a completely autocratic manner the methods of their operation is a well designed and worked out technic, designed to achieve the objectives that they achieve. The advisory committees that they select (bear in mind that they select their own advisory committee) are carefully chosen to produce a preponderance of sentiment leaning toward the objectives that they desire to reach. It is not a representative committee of the thought of the medical profession of the United States. The presence of Dr. Bauer on that committee, chosen as an individual, does not in any way represent the official actions of the American Medical Association or of any similar group in the United States. All of you know that it would be quite possible for any one to pick from any group seven or eight who would be definitely opposed to the majority of sentiment. The advisory committee chosen by the Children's Bureau does not represent American medicine. I would emphasize the analogy to the proposed advisory committee under the Wagner-Murray-Dingell bill. Under that bill there is an endeavor to set up such a pattern. The Surgeon General of the United States Public Health Service under that bill is authorized to set up an advisory committee which he himself appoints, and then he may take the advice or not, as he pleases. There again is a pattern for autocracy by bureaucracy, and that is something to be condemned with the utmost condemnation that medicine can provide.

A second point on which I would lay particular stress is the observation of secrecy in action until opposition becomes too late. Dr. Bauer as a member of that advisory committee has not the right or privilege, when he returns here to Chicago from a meeting, to tell publicly what went on. He must reserve such statements until they are officially released by the agency which he advises. The timing seems invariably such that it is all over before we can print what happened. That seems to be the pattern of action by the Children's Bureau. As to whether or not any one can accomplish anything in this problem remains to be seen. For many years there has been a deter-

mined effort throughout the United States to get coordination of health activities under the federal government. There was an act of Congress authorizing the President of the United States to coordinate various related activities under the executive administration. The President himself, desirous as he may have been to include the health activities of the Children's Bureau under the Federal Security Administration, which now includes the United States Public Health Service and the Food and Drug Administration and a considerable number of other medical activities, found it impossible to get the Children's Bureau included under a single coordinated administration. Until that is done there will no doubt be a continuation of exactly this sort of performance—the performance of a bureaucracy which is autocratic in its methods, secret in its operations and astute besides.

When a matter of this kind comes before us, the editor of *THE JOURNAL* must be guided by the policies of the House of Delegates or by an action of the Board of Trustees. When the House of Delegates has not taken action between meetings of the Board of Trustees, an endeavor is made to secure the point of view of the Board of Trustees by correspondence. This matter, as you have heard, came up gradually. It developed in the form of a small appropriation, which then became a larger appropriation. It came in as an appropriation bill. The actions taken are not the actions of the Congress but the regulations of the Children's Bureau under advice of its solicitor, and leaning on its advisory committee. If you criticize them they say, "We were advised by the Advisory Committee, which included representatives of the medical profession. We thought we could take their advice."

Whether or not this is an entering wedge, a foot in the door for federalized medicine, I am not at all certain. I endeavor to observe trends in government and in legislation; I would emphasize Mr. Holloway's statement as to the action of the Appropriations Committee of the House of Representatives on Dr. Parran's request for \$1,000,000, and the positive statement of the Appropriations Committee that it did not believe in the use of federal funds to give medical care in the individual states, that that was a local responsibility. That seems to me to begin to represent the trend. The innumerable letters that have come from Senators and Representatives on this point also indicate a changing trend in thought, largely brought about, I believe, by activities of the medical profession in recent years. Equally a general resentment seems to be growing up through the United States to too much government interference in private life, no doubt justified by the war, but unquestionably bound to be resented at the earliest possible opportunity after the war. If you will observe the advertisements appearing in numerous magazines and newspapers, the editorials now being published and the cartoons, you will discover that there is a growing trend, a growing resentment, against too much federal interference in private life in the United States. Maybe if it grows enough eventually the Children's Bureau will be included where it belongs as a part of a single federal agency concerned with health.

DR. L. W. MASON, Denver: I too, like Dr. Rucker and perhaps several others in the audience, am one of those who, being endowed with less brains than the average man, in the course of time became an obstetrician. I don't care to go into the fee part of this maternal and child welfare bill in detail. I would like to say, regarding Colorado's attitude toward this, that last summer, as editor of the *Rocky Mountain Medical Journal*, I met with Dr. Cleere, the secretary of the state health board, who has the administration of this plan in Colorado, and with members of the Child and Maternal Welfare and Public Policy committees of the state medical society. Dr. Cleere had with him and gave to us a sheaf of papers about fifteen pages in length which embraced the provisions of this federal plan. Dr. Cleere had been told to, or had been given permission to submit a plan to the federal bureau of his own, and we presumed that what he would get back would be a compromise between what we had recommended and what had been proposed. After a considerable number of alterations, particularly in fees, and, as I say, I am not going to discuss individual fees in these remarks, the program was approved by the Public Policy Committee and by the Maternal and Child

Welfare Committee of the state medical society; to be brought up before the house of delegates, which didn't meet for about five or six weeks, for the approval of the state medical society. We did not get back from the Children's Bureau (or wherever it came from) a reply to our proposed proposition until after the state society met, and the state society through its house of delegates did ratify it, with the strict limitation that it was considered by the doctors who participated in it as strictly a patriotic measure and that it would not be approved for a period longer than six months after the emergency was over. The House of Delegates approved not what has been proposed but the schedule we have made, which involved some changes. After the house of delegates of the Colorado State Medical Society had met and approved what we proposed, we received back the plan from the Children's Bureau in practically the identical form we had received it before the meeting that night. One reason why Dr. Cleere was in a hurry at our meeting that night and said he could not wait to submit this until after the house of delegates met was the fact that his office was being besieged daily with dozens of applications from the wives of servicemen who had already found out—I won't say they had been told—but they all found out that they were to have this care, and his office was besieged all day long by expected recipients of this care, as to where to go to receive this manna from heaven.

Several times this morning we have heard speakers say they have been asked to serve in an advisory capacity to various governmental bureaus. If there has been any change in the activity of any bureau as a result of these advisory committees that we have furnished them, it has not been apparent in anything any one said to us this morning. As has been brought out very frequently, we are constantly put on the defensive in these matters because we don't know anything about them until after it is all done, and then it is too late to make any changes in the matter. It was pitiful to read in *THE JOURNAL* two or three years ago about our efforts to get somebody from the American Medical Association to represent the doctors on the Federal Planning Commission. We never did have a real invitation to that, and finally we were permitted to have some one there as an auditor. We had no voice whatever in the decisions that were made which affect us as the ultimate givers of the services involved.

I am firmly convinced that the time has come when there should be some change in the organization of the American Medical Association which will permit us to have some legally constituted bargaining agent whereby we can demand that we be given a voice in anything that affects us directly, and not be placed in the perpetual position as supplicants even for an auditor at these meetings which involve the services that you and I as individuals give. I would like to invite the editors and secretaries of this conference, who have a lot to do with molding the opinion of doctors throughout the country, to an editorial which I wrote and which is in the October number of the *Rocky Mountain Medical Journal* along those lines.

DR. P. T. TALBOT, New Orleans: Being one of the representatives of a black sheep state, so called because we were rather late in getting around to this proposition, I would like to have you recognize, Mr. Chairman, our distinguished president of the Louisiana State Medical Society, who is here and will tell you why we were so slow about adopting this measure. He is Dr. C. C. deGravelles, president of the Louisiana State Medical Society. I wish you would recognize him.

THE CHAIRMAN: The Conference recognizes Dr. deGravelles.

DR. C. C. DEGRAVELLES, New Iberia, La.: At the meeting of the Louisiana State Medical Society last April this proposition was put before the house of delegates. The house of delegates turned it down in toto; then they reconsidered and asked that the president appoint a committee to look into the matter. I appointed a committee composed of Dr. O'Ferrall as chairman, with two other members, and Dr. O'Ferrall did a wonderful piece of work. He contacted many other states and got their views. After going into the thing very thoroughly and we turned it down again. Then we got another plan. I called several meetings of the executive committee of the state, and each time it was turned down, until about six weeks ago we began to be really "worked on." I began to receive letters

from high officials wanting to know where the patriotism was of the doctors of Louisiana, because we were going back on the enlisted men. I had several letters from the American Legion, and we began to be criticized from all directions. We are having a governor's race in our state now, and the politicians began to jump on me. So I called another meeting of the executive committee and we accepted the proposal under protest. It is now before the Children's Bureau in Washington. We turned this down for several reasons, but one of the principal reasons was the "foot in the door" angle. It seems now that we have two feet in the door. At first it was the care of the obstetric end, but now, as I understand it, we are supposed to take care of any emergency that arises. Another factor that is worrying us very much in Louisiana is the fact that we have between 300,000 and 400,000 soldiers being trained there in our camps. We are extremely short of physicians. Louisiana has oversubscribed its quota in physicians to the Army. Conditions existing around those camps are not good. Around Alexandria the doctors are hardly able to take care of the civilian population. Now the soldiers' wives are drifting in. How the doctors are going to take care of them I do not know. The hospital facilities simply are not available. I have one friend who told me about 2 cases he had last week, which were delivered in a little one room shack with absolutely no help. Now the women are being left there. What is going to happen to those cases? We do not have the hospital facilities for them. I find that the doctors throughout the country are ignorant about this proposal. I believe we should tell our story to the American people through every available means. If the American Medical Association must forfeit its tax exemption status for the privilege of interpreting the medical profession to the American people let us get together and do something about it. I believe the American Medical Association should have an information bureau in Washington to maintain continuous communication between the medical profession and the people, between the agencies and legislation who are interested in the service that the American medical profession renders.

DR. ANDERSON: Mr. Chairman, I wouldn't have come to this platform if the name of Texas hadn't been drawn into this discussion, and the members of the conference are entitled to know its position, as far as the medical profession is concerned. Texas is one of those states which have been publicized far and wide as not having accepted the program of the Children's Bureau. The publicity which has come from the Children's Bureau, pointing out that Texas hasn't done so, has been hurtful to the medical profession of Texas. It has been that type of publicity. Actually the reason why that program is not operating in Texas as it is supposedly operating elsewhere is not the action of the State Medical Association of Texas but legal complications which have made it impossible for our state health officer to receive the moneys to be disbursed according to this program, or so it has been reported to us. Now, when those legal complications are done away with you are going to see the announcement in the public press that Texas has joined the vanguard and has this program in operation. Then again I want you to remember that it isn't going to be in operation in Texas with the approval of the State Medical Association of Texas, because the State Medical Association of Texas, through its executive council, has neither approved the plan officially nor disapproved it. It has done as we have heard discussed here—recognized that this program is another example of the socialization of medicine. To try to curb or stop some of the tendencies of various bureaus of the federal government in these "foot in the door" matters, our executive council meeting at Fort Worth on July 13 (and I am referring now to the threats to socialized medicine confronting us, such as the Farm Security Administration with its medical program, the Department of Agriculture with its experimental health program, the Children's Bureau with its maternalistic plan of paying the doctors directly for services to the wives and children of enlisted men in our armed forces and perhaps others)—adopted the following resolution:

Whereas, The medical profession as an organization is solicited and urged by various governmental agencies to enter into agreements and contracts sought to be made for the purpose of supplying the hospital and medical services to certain specified groups of our people; and

Whereas, We feel that all such agreements and contracts sought to be made by governmental agencies with the medical profession as an established organization would ultimately regiment medical services to the sick, if such contracts and agreements were agreed to and entered into by our profession as an organization; therefore, be it

Resolved, By the Executive Council of the State Medical Association of Texas, in called meeting this day assembled,

"First: That the State Medical Association of Texas, its component societies, committees, bureaus, representatives and officers be advised and directed, as such, not to sign or agree to any plan, agreement or contract sought for the purpose of providing hospital and medical care for any designated group or groups.

Second: That any physician as an individual is free to make any agreement or contract with any group, agency or organization for the purpose of rendering his medical care and services to any persons designated and agreed on. All fees and all terms of any contracts or agreements made and entered into to be decided and fixed by the physician as an individual and any agency or any authority which may be a party to the contract.

Third: The medical profession never has, does not now and never will seek to escape any duties or obligations. We yield to no group when loyalty and devotion are called on to protect the interest and welfare of our people

DR. C. N. JAEKEL, Detroit: It seems to me there is one point that should be cleared. I refer to the responsibility for what Dr. Foster has referred to as the edict of the Children's Bureau. Dr. Daily said they secured advice from the attorney general of the United States. We wrote to the attorney general of the United States and asked for a copy of that opinion, and he sent us an opinion to the effect on another point, namely to the effect that osteopaths could participate in this program. I would like to ask Dr. Daily if the opinion to which he referred, on the basis of which the Children's Bureau says the money cannot be paid to the women directly, is in writing?

DR. DAILY: Yes, the opinion from the solicitor of the Department of Labor is in writing. Of much more importance is the action of Congress during recent appropriation act discussions when the specific point was brought to its consideration, that is the amendment proposed to the House making the benefit payment to the wife. The House turned down that amendment.

DR. JAEKEL: That was a negative action of Congress, and it is reasonable. It denied and refused to accept something that was positive. The fact that Congress turned down the proposed amendment does not mean that it mandated that the money should be paid to the doctors.

DR. L. W. LARSON, Bismarck, N. D.: Representing a state in which the plan has been definitely turned down, I want to get into that select group of three states that do not want the president of the Louisiana State Medical Society to go home with the idea that there are only two states that have rejected the plan. You allowed yourselves to get into this mess. We turned it down, and fortunately we had enough friends in high places in our state who stood with us. As long as we have a governor who is a Democrat, a friend of the medical profession—he controls the state board of health; the chairman and the counsel of the state board of health is the chairman of our Committee on Maternal and Child Welfare; the state health officer depends for his livelihood on the appointment not only from the governor but on the recommendation of that counsel—as long as that state of affairs exists in our state we are not going to have a plan in operation in North Dakota that is not entirely acceptable to the profession of our state.

WOMAN'S AUXILIARY

Montana

The Woman's Auxiliary to the Silver Bow County Medical Society was organized recently. The organization meeting was presided over by Mrs. P. E. Logan, Great Falls, president of the Montana State Medical Association auxiliary. The following officers were elected: president, Mrs. Harold Schwartz; vice president, Mrs. T. J. B. Shanley; secretary, Mrs. P. E. Kane; treasurer, Mrs. C. B. Rodes.

North Carolina

The executive board of the North Carolina auxiliary met at the home of Dr. and Mrs. P. P. McCain at Sanatorium, October 14. Twenty-one members were entertained at luncheon.

North Carolina, under the direction of Mrs. B. W. Roberts, war participation chairman, plans to furnish thirty emergency medical kits to small ships of the Coast Guard and the Navy. It expects to help enlist nurses, interest members in first aid classes, Red Cross and other organizations connected with national defense, and have drives for surgical and medical supplies.

Pennsylvania

The Woman's Auxiliary to the Medical Society of Pennsylvania held its state convention recently in Philadelphia. Mrs. Charles G. Eicher, Mount Lebanon, state president, presided.

South Carolina

At the Pickens County medical auxiliary meeting recently plans for a county hospital were discussed, the new tuberculosis field worker talked of her work, and an informative article on penicillin was read.

The midyear executive board meeting of the South Carolina auxiliary convened in Greenville, October 13, with Mrs. J. E. Orr, president, presiding. The student loan fund, no longer needed since the government had taken over medical students, was turned into war bonds.

Texas

The Texas auxiliary is having well attended meetings in the various county auxiliaries. Mrs. A. B. Pumphrey of Fort Worth is president. In the Kerr-Kendall-Gillespie-Bandera Counties auxiliary twenty-one members reported that it had given 453 hours to Red Cross work during the summer. Tuberculosis Christmas seals were sold under the sponsorship of the Kerr County auxiliary. The Jefferson County auxiliary is giving one day a month to Red Cross work. The El Paso County auxiliary and Dallas County auxiliary are also active.

The executive board of the Texas auxiliary met recently in Fort Worth with Mrs. A. B. Pumphrey, state president, presiding. She gave an interesting address and stated her aims for the year. The auxiliary will sponsor an essay contest on the subject "Medical Science Fights at Home and Abroad." Members were urged to fight the Wagner-Murray-Dingell bill, and Dr. R. B. Anderson, guest speaker, gave four concrete ways in which the auxiliary could help the medical profession.

West Virginia

A special committee from the executive board of the Woman's Auxiliary to the West Virginia State Medical Association recently met with the Fact Finding and Planning Committee of the association in Huntington for the purpose of completing plans for a statewide educational program pertaining to constitutional government.

Mrs. V. E. Halcomb, Charleston, a past president of the national auxiliary, is chairman of the speaker's bureau for West Virginia.

The West Virginia auxiliary held its fall board meeting in Charleston recently, with twenty-two members present. It plans to publish a news letter, which will be sent to each member and to the doctors from West Virginia who are in military service.

Wisconsin

Mrs. L. H. Lokvam, president-elect of the Wisconsin auxiliary, was a guest of the Woman's Auxiliary to the Kenosha County Medical Society at its October meeting. Dr. C. C. Davis, president of the Kenosha Medical Society, spoke to the group on "Medical Legislation."

Ten past presidents of the Woman's Auxiliary to the Medical Society of Milwaukee County were hostesses at the opening luncheon and fall meeting at the City Club recently. The guest speaker was Dr. John F. Lundy, Rochester, Minn., who discussed "Painless Childbirth."

Fond du Lac, LaCrosse and Sheboygan auxiliaries also report interesting fall meetings.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Annual Course in Ophthalmology and Otolaryngology.

—The thirteenth annual midwinter postgraduate clinical convention in ophthalmology and otolaryngology, January 17 to 28, under the auspices of the Research Study Club of Los Angeles, has been designated the John Finch Barnhill Memorial Program in honor of the late Dr. Barnhill, who directed the program for so many years. A special course in "Applied Anatomy and Cadaver Surgery of the Head and Neck" will be given from January 28 to February 1. Among the lecturers will be:

- Dr. Georgiana M. D. Theobald, Oak Park, Ill., Anatomy and Histology of the Anterior Segment of the Eyeball with Special Reference to the Canal of Schlemm.
Dr. James Watson White, New York, Pathological Variations: Individual Muscles; Associated Movements; Convergence Divergence; Sursumvergence and Rotation.
Irving B. Lucke, M.S., Rochester, N. Y., Some Optics of Ophthalmic Lenses.
Dr. Meyer Wiener, Coronado, Calif., Surgery of the Eye.
Weston A. Price, D.D.S., Banning, Calif., Deficiency Diseases and the Eye, Ear, Nose and Throat.
Dr. Isidore Friesner, New York, Neoplasms Involving the Middle Ear.
Dr. Clinton H. Thienes, Los Angeles, Statistical Evaluation of Data Obtained in Experimental and Clinical Study.
Dr. Arthur W. Proetz, St. Louis, Common Misconceptions in the Management of Sinusitis.
Dr. Samuel Salinger, Chicago, An Analysis of Etiologic and Diagnostic Factors in Chronic Sinusitis.
Dr. Isaac H. Jones, Los Angeles, Vitamins and the Eye, Ear, Nose and Throat.
Dr. Paul M. Hamilton, San Marino, Calif., The Use of Penicillin in Ophthalmology and Otolaryngology.
Dr. Lawrence K. Gundrum, Los Angeles, The Effects of Sulfonamide Solutions on the Nasal Mucosa.
Dr. Carl H. McCaskey, Indianapolis, Ludwig's Angina.
Dr. Gordon B. New, Rochester, Minn., Laryngeal Lesions: Diagnosis and Treatment.

The annual meeting of the Los Angeles Society of Ophthalmology and Otolaryngology will be a feature of the meeting January 17, and on January 22 the western section of the American Laryngological, Rhinological and Otolological Society will hold its annual session.

CONNECTICUT

Clinics for Inebriates.—A diagnostic and guidance clinic for inebriates will be opened in New Haven in February under the joint sponsorship of the Yale Laboratory of Applied Physiology and the Connecticut Prison Association. A similar clinic will also be opened in Hartford in the near future. With the active participation of the Connecticut State Medical Society and religious and civic organizations, the clinics will deal with both the prevention and the control of inebriety. Their objectives will be to contribute toward the prevention of inebriety, to aid the inebriate to regain his usefulness in the community, to ease the economic burden imposed by present handling of inebriates, to ease crowding of prisons and jails, to serve as consultants to courts and welfare agencies, to serve as advisers to inebriates and their relatives, to acquaint the public in general with the medical aspects of inebriety and to serve as experimental models for future procedures, to train social workers in this field and to provide material for clinical-statistical research studies. The plan for the clinics was worked out in close cooperation with Chief Justice William M. Maltbie, Hartford, president of the Connecticut Prison Association, and their opening is assisted by a large contribution to the association by an anonymous Hartford donor. Each clinic will be staffed by psychiatrists, a psychologist, a social worker and a clerk, with representatives of Alcoholics Anonymous and the Salvation Army on call, and will work under the supervision of Elvin M. Jellinek, Sc.D., director of the School of Alcohol Studies, Yale Laboratory of Applied Physiology, the medical director of clinics and a legal consultant. According to a release from Yale University, the clinics will take advantage of the existing institutions of the state and serve as a clearing house for them. The creation of an institution for the treatment of inebriates at present is not contemplated, it was stated. Dr. Ralph S. Banay, psychiatric consultant of the New York State Parole Board and formerly chief psychiatrist of Sing Sing Prison, will be the medical

director and will supervise both the New Haven and the Hartford clinic. Dr. Clements C. Fry, New Haven, psychiatrist of the Yale Department of Health, will serve as adviser. Dr. Banay will also participate in the routine clinical work. Anna Roe, Ph.D., a member of the staff of the School of Alcohol Studies, will be in charge of psychologic testing, and Raymond G. McCarthy will have charge of the social work. The Hartford clinic will be served by a psychiatrist four days a week and the New Haven clinic three days a week. The social workers and clerks will serve full time at each clinic. Dr. Howard W. Haggard, director of the laboratory of applied physiology at Yale, who will be in general charge of the program, stated that these clinics are the first of the kind to be set up in this country. Persons referred to the clinic will be interviewed by the psychiatrist and investigated by the social worker. The psychiatrist's recommendations will be based on his finding as modified by a knowledge of the patient's personality, his family and employment relations and other factors. He may recommend court or voluntary commitment for treatment or contact with Alcoholics Anonymous or the Salvation Army and make the contact of special occupation or private treatment. No specific sanatorium or therapist may be named, but the patient will be given a list of sanatoriums and private practitioners specializing in the treatment of alcoholism approved by the Connecticut State Medical Society. Medical examinations will not be given at the clinics, but patients will be referred to practitioners selected from a panel prepared by the state medical society, the cost to be borne by the clinic. The advisory committee appointed by the state medical society is composed of Drs. Arthur B. Dayton, New Haven; Leslie R. Angus and Foster E. Priddy, Hartford; Louis H. Cohen, Norwich, and Francis M. Shockley, Stamford.

ILLINOIS

Dr. Sievers Named Chief of Communicable Diseases.

—Dr. Jerome J. Sievers, assistant state health director, has been appointed chief of the division of communicable diseases, effective January 1, succeeding the late Dr. John J. McShane. Dr. Sievers resigned as assistant director, a position which he had held since Sept. 1, 1943, to accept the new appointment. Dr. Sievers was graduated from the University of Illinois College of Medicine in 1935 and received his M.S. degree at the University of Michigan in 1939, the same year in which he joined the state department of health. Prior to his appointment as assistant state health director he served as assistant to the chief of the division of communicable diseases.

Cancer Forum.—The Chicago Cancer Committee, Inc., will sponsor a forum for residents of the North Shore suburbs at the Winnetka Community House, January 18. Dr. Irving S. Cutter, Wilmette, medical superintendent, Passavant Memorial Hospital, will be the moderator, and Dr. Ludvig Hektoen, chairman of the Chicago Cancer Committee, will make the introductory statement. Among the speakers will be:

- Dr. Bowman C. Crowell, The Course of Cancer.
Dr. Josiah J. Moore, The Causes of Cancer.
Dr. Herbert E. Schmitz, The Diagnosis of Cancer.
Dr. John A. Wolfer, The Curability of Cancer.
Dr. Frederick W. Merrifield, What the Patient Can Do About It.

The Winnetka forum will be the fourth arranged by the Chicago Cancer Committee for the public to give information about the curability of cancer when treated in an early stage.

Chicago

Births Set New Record at Chicago Lying-In.—The total number of deliveries at Chicago Lying-In Hospital and Dispensary of the University of Chicago was 3,813 during the year ended June 30, 1943, according to a recent release. The total, an increase of 11 per cent over the previous year, recorded an all time high for the institution for its forty-eight years' existence. The mortality among newborn infants was 3.1 per cent for babies who were either stillborn or died during the first two weeks of life.

Changes in the Faculty at Northwestern.—New appointments to the Northwestern University Medical School include Dr. Malcolm T. MacEachern to associate professor of medicine, Dr. Henry C. Sweany to associate professor of medicine, Dr. John Carroll McCarter to assistant professor of pathology and Chi Che Wang, Ph.D., to assistant professor of physiology. Recent promotions at the school include those of Drs. Abraham Levinson to associate professor of pediatrics, Frederick W. Merrifield to assistant professor of surgery and Leonard Cardon to assistant professor of medicine.

Chilean Visitors in Chicago.—Col. Flavio Meza Olva, prospective surgeon general of the Chilean army, and Major Ramon Vicuna Herboso, surgeon attached to the army headquarters, were accompanied by Capt. Gustave Freeman, M.R.C., Surgeon General's Office, Washington, D. C., on a tour of medical points of interest in Chicago, January 5-9. Among the places visited were the American Medical Association, American College of Surgeons, American Dental Association and the local medical schools. They were guests of the American Medical Association during its radio broadcast entitled "Doctors at War" over NBC on January 8.

Medical Missionaries Home on Gripsholm Honored.—A luncheon was held on January 7 at the Hotel LaSalle under the auspices of the Chicago Committees and the Christian Medical Council for Overseas Work to honor American missionary doctors and nurses just returned on the *Gripsholm*. Among those present were Drs. William W. Cadbury, Canton, China, Ernest H. Clay, Foochow, China, and John Horton Daniels, Nanking, China, and Johanna Margaret Friberg, R.N., Willie Pauline Harris, R.N., and Alice Maud Powell, R.N. Dr. Walter H. Judd, representative from Minnesota, was the guest speaker. Dr. Judd, who in 1942 received a medal "of honored merit" for wartime services to China, was formerly a missionary in China.

KANSAS

Dr. Mayes Joins Children's Bureau.—Dr. William Fred Mayes, Topeka, has resigned as director of the division of maternal and child welfare of the Kansas State Board of Health, effective Dec. 1, 1943, to become regional medical consultant for the Children's Bureau, Washington, D. C. Temporarily, Dr. Mayes is to be located in the Kansas City district. He has been director of the state division of maternal and child welfare since May 1, 1942.

The Porter Lectures.—Dr. Herbert M. Evans, director of the Institute of Experimental Biology, University of California, Berkeley, gave three lectures under the Porter Lectureship in Medicine at the University of Kansas School of Medicine, Lawrence-Kansas City, December 8-9. The titles of Dr. Evans lectures were "The Present Position of Our Knowledge of the Anterior Hypophyseal Hormones," December 8, "The Internal Secretions of the Pituitary Body: A Historical Resume," and "The Adrenotropic Hormone of the Anterior Hypophysis," December 9.

MARYLAND

New Director of Child Hygiene.—Dr. Dean W. Roberts, Baltimore, was recently appointed chief of the bureau of child hygiene of the Maryland State Department of Health. He succeeds Dr. Edward Davens, Baltimore, who was granted military leave on Oct. 11, 1943.

One Hundred and Fifty Years of Health.—The December *Baltimore Health News* commemorates the 150th anniversary of the founding of the public health service of the community, resulting in the present city health department. The first local health unit board was organized in Baltimore in 1793, announcing in that year that Baltimore is "free from the Yellow Fever." This fact has peculiar historical significance because of the epidemic of yellow fever among the 40,000 inhabitants in Philadelphia in that year, when a group of 4,044 died of yellow fever. *Baltimore Health News* carries the development of the board from its inception and touches on the organization of similar boards in Boston, Philadelphia and New York, recalling that the first president of the Boston town board of health in 1799 was the renowned Paul Revere. In 1793 "an act to appoint a health officer for the port of Baltimore-town, in Baltimore County" was prepared and now hangs in the state hall of records in Annapolis bearing the signature of the governor, Thomas Sim Lee, and the date of assent, Dec. 28, 1793. The act contains a section authorizing the erection of a temporary quarantine hospital, this probably stemming from the fear of yellow fever, which had been reported in Philadelphia and which subsequently caused a devastating epidemic.

MASSACHUSETTS

Boston Dispensary Offers Fellowships in Medicine.—The Boston Dispensary offers six fellowships in medicine in its clinics and domiciliary medical service for appointments immediately or before July 1. The fellowships are approved by the American Board of Internal Medicine in satisfaction of graduate training. Additional information may be obtained from Mr. Frank E. Wing, director of the Boston Dispensary, 25 Becket Street, Boston.

Personal.—Dr. Harvey Spencer, Wellesley, has resigned as acting director of the Habit Clinic for Child Guidance and as psychiatrist at the Judge Baker Guidance Center, Boston, to join the staff of the Austen Riggs Foundation, Stockbridge. —Dr. Valy Menkin, formerly assistant professor of pathology at the Harvard Medical School, Boston, is now associate in research at the Fearing Research Laboratory of the Free Hospital for Women, Brookline, where he will continue his studies in general pathology with particular emphasis on inflammation and cancer research.

Children's Clinic Named for Physician.—The new Southard Clinic for Children and Adults was recently opened in Boston under the auspices of the Massachusetts Department of Mental Health. The clinic is a memorial to the late Dr. Elmer E. Southard, first director of the Boston Psychopathic Hospital in 1912. Dr. Harry C. Solomon, recently appointed professor of psychiatry, Harvard Medical School, Boston, was chosen medical director to organize the clinic and is assisted by Drs. Oscar J. Raeder and Edgar C. Yerbury as co-directors. According to the *Monthly Bulletin* of the state society for mental hygiene, the present staff of the clinic comprises five psychiatrists, one neurologist, six psychologists and nine psychiatric social workers. The clinic fulfils the need of a mental hygiene center for children and adults. It is an outpatient unit equipped with modern facilities for study and treatment of psychiatric and neurologic conditions. It functions as a psychiatric teaching and training center for members of the medical, nursing and psychiatric social work professions.

MICHIGAN

Students Win Scholastic Awards.—At the commencement exercises of Wayne University College of Medicine, Detroit, December 9, the distinguished service award given to the student outstanding in scholarship and extracurricular activities went to Dr. Steven E. Staryk, Detroit, president of the Student Council. The Alumni Award, presented to the student who has maintained the highest scholastic standing during his four years in the college, was given to Dr. Oscar J. Balchum, Detroit.

Personal.—Orin E. Madison, Ph.D., Detroit, has been reelected president of the Board of Examiners in the Basic Sciences for the State of Michigan. Arthur M. Chickering, Ph.D., Albion, was elected vice president. —Drs. Robert L. Schorr and Otto T. Toepel, Detroit, who are honor members of the Wayne County Medical Society, have been elected to emeritus membership in the Michigan State Medical Society. —Harold S. Adams, Ph.D., recently chosen vice president and director of production of the Upjohn Company, Kalamazoo, died December 4.

MINNESOTA

County Society Plans Group Annuities.—A group plan combining low cost life insurance annuities for members wishing to participate has been recommended for acceptance to its members by the board of directors of the Hennepin County Medical Society. A basic policy of \$5,000 insurance and an annuity at \$50 per month at age 65 is a feature of the plan, members to purchase additional units as desired.

Special Society Elections.—Dr. Walter P. Gardner, St. Paul, was elected president of the Minnesota Society of Neurology and Psychiatry at a meeting in Minneapolis November 12. Dr. James W. Kernohan, Rochester, vice president and Dr. Royal C. Gray, Cambridge, secretary-treasurer. Dr. Kernohan discussed "Healing of Brain Wounds" at the meeting and Dr. Joseph C. Michael, Minneapolis, "Acute Ascending (Landry's) Paralysis." —Dr. Bayard T. Horton, Rochester, was elected president of the Minnesota Society of Internal Medicine at its recent annual meeting in St. Paul.

Continuation Course in Otolaryngology.—The Center for Continuation Study at the University of Minnesota, Minneapolis, announces a continuation course in otolaryngology for physicians who limit their practice to ophthalmology and otolaryngology, February 7-11. Registration will be limited to 50 physicians. The faculty will include:

Dr. Oscar V. Batson, assistant professor of otolaryngology, University of Pennsylvania School of Medicine, Philadelphia.

Dr. Paul H. Holinger, associate in laryngology, rhinology and otology, University of Illinois College of Medicine, Chicago.

Dr. John R. Lindsay, professor of surgery, department of otolaryngology, University of Chicago School of Medicine.

Dr. Theodore E. Walsh, professor of otolaryngology, Washington University School of Medicine, St. Louis.

Dr. Lawrence R. Boies, clinical associate professor of otorhinolaryngology, University of Minnesota Medical School, Minneapolis.

Additional information may be obtained from the Center for Continuation Study, University of Minnesota, Minneapolis 14.

NEW JERSEY

Rotarians Serve as Hospital Helpers.—The Rotary Club of Elizabeth recently created a system of "volunteer corpsmen" who work in the emergency and operating rooms at the local hospital as well as with the ambulance detail. The system was worked out to overcome the manpower shortage at the hospital. The Rotary Club named a committee, made the activity communitywide, lined up 30 volunteer "corpsmen" and then outlined long range plans for training classes to take care of additional volunteers. The men work in three shifts that run from 7 a. m. to 11 p. m. and, according to the *Rotarian*, "lift, carry, push and shove heavy hospital equipment. They bring patients to the operating room, stand by as anesthesia is administered, manipulate the lights needed by the surgeon, return the patient to his bed and then come back to mop up the floor. They drive the ambulance, handle its passengers. They operate laundry equipment. They help out in the mental hygiene ward. And in addition should any major disaster, such as an air raid, a plant explosion or a transportation smash-up, put an added burden on the hospital's facilities, the 'corpsmen' are pledged to put in needed 'emergency hours' to help out." The plan started when a hospital superintendent, a member of the Rotary Club, discussed the shortage of help, particularly with heavy work, at the hospital during a meeting of the Rotary Club.

NEW YORK

Personal.—Dr. Mark D. Doby has been appointed health officer of Schuylerville. —Dr. Hugh H. Shaw on January 1 entered his twenty-fifth year as health officer of Utica. —Dr. Terry S. Montague, Gouverneur, has been appointed health officer of Watertown, succeeding Dr. George B. Van Doren, retired.

Canvass of Home Accidents.—As a part of an educational program the State Home and Farm Safety Advisory Committee is collecting information on the statistics of non-fatal home accidents through the cooperation of volunteer canvassers and householders in a house to house canvass of home accidents. The cities of Oneida, Saratoga Springs and Oswego have already submitted reports, and the canvass is in progress in fifteen other cities. According to *Health News*, steps are being taken in the larger cities to organize a canvass on a basis of a cross section of the population, the project to be continued throughout the winter and early spring. No names of individuals are entered on the record forms, but there apparently is little or no reluctance to report an accident or even to take the blame for it if a human factor was in any way responsible. The most unusual and costly accident thus far reported was the explosion of a can of lye, *Health News* stated. The extensive burns which resulted required plastic surgery, and the cost of hospital and medical care ran into several thousand dollars. The accident was believed to have been caused by a manufacturing defect. Stepping on broken glass left on the floor in the dark caused an accident which resulted in the longest period of invalidism reported. When the survey is completed the statistics will be analyzed by the National Safety Council, which recommended the project, and the results will be used for national and state guidance in home accident prevention. The state department of health and the office of civilian mobilization of the state war council are sponsoring the project.

New York City

Psychiatrist Addresses Public Meeting.—Dr. Walter S. Maclay, medical officer in charge of the Mill Hill Emergency Hospital, London, addressed an open meeting on January 3 sponsored by the Medical Society of the County of Kings, the Brooklyn Chapter of the American Red Cross and the Brooklyn Council for Social Planning. Dr. Maclay discussed the treatment of war neurosis in Britain.

Dr. H. C. Taylor Appointed Chairman of Obstetric Department.—Dr. Howard C. Taylor Jr., associate professor of gynecology and obstetrics, New York University College of Medicine, since 1935, has been appointed chairman of the department of obstetrics and gynecology at the school. Dr. Taylor, who is associate editor of the *American Journal of Obstetrics and Gynecology*, graduated at the Columbia University College of Physicians and Surgeons in 1924.

Conference of Tuberculosis and Health Association.—The annual conference of the New York Tuberculosis and Health Association will be held at Hotel Pennsylvania on Wednesday, February 2. There will be morning section meetings on tuberculosis, the heart diseases, social hygiene and dental health in industry. The meeting on heart diseases will

be held at Hotel Governor Clinton. At a luncheon meeting in the Hotel Pennsylvania the speakers will be Rear Admiral Charles S. Stephenson (MC), U. S. Navy, and Sir Gerald Campbell, British minister in Washington and special assistant to the British ambassador.

Offers Plan to Eliminate Medical "Kickbacks."—A plan to eliminate "kickbacks" to physicians was outlined on December 15 to the Moreland Commission inquiring into alleged abuses in the administration of the workmen's compensation act by Dr. David J. Kaliski, chairman of the workmen's compensation boards of the Medical Society of the County of New York and of the Medical Society of the State of New York. According to the *New York World-Telegram* Dr. Kaliski first told the commissioners that more than 500 cases of alleged fee splitting had been investigated to date by the county society. Although no action had been taken, he is reported to have said that there "will have to be a number of trials." He advocated the sending of a joint itemized bill by physicians and specialists working on the same case "indicating how much each doctor would receive." One commissioner is reported to have observed that the plan seems "just a device for legalizing kickbacks." Dr. Kaliski, in reply, said that his plan was "the very opposite of kickbacks," asserting that such a plan is needed, particularly among the lower income groups in which the surgeon's fee, "usually rather high," is paid, whereas the family doctor often waits in vain for his payment.

Inter-Racial Policy Adopted at Sydenham Hospital.—A voluntary inter-racial policy has been adopted by Sydenham Hospital, providing for the first time in Harlem this type of hospital having all the rights and privileges of other voluntary hospitals in New York, such as tax exemption, support by the city, support from the Greater New York Fund and United Hospital Fund, and taking its place on a parity with New York's eighty-six other voluntary hospital institutions. The hospital will be staffed by Negro as well as white persons and directed by a hospital board composed of Negro and white persons. The new policy assures the use of the hospital facilities to all persons regardless of race, religion or national origin. It will be so organized as to provide qualified Negro physicians through staff positions with opportunities to hospitalize and care for their own patients and to improve their own medical competence. Private or ward accommodations will be provided according to the patient's ability to pay. According to a release, this hospital will become the first hospital which adheres to and proclaims the principle of inter-racial equality in hospital service in all its phases. The organization committee of the project is sponsored by the New York Urban League, Inc. Under the plan there will be no limitation on the number or quota of Negro physicians who may become attached to the staff. The present staff of the Sydenham Hospital will remain, it was stated. The group also plans to work toward the integrating of Negro medical, nursing and technical personnel into all hospitals in New York City.

OHIO

Walter Hartung New Health Director of Toledo.—Dr. Walter H. Hartung, in 1940 acting city health director and for some time associated with the Toledo Board of Health, has been appointed health officer, succeeding Dr. Earl E. Kleinschmidt, resigned. The change was effective on December 1, newspapers reported. Dr. Kleinschmidt had held the position since Nov. 1, 1942. Dr. Hartung, who formerly was state health officer, for some time had been superintendent of medical relief bureau in the city health department.

Museum Establishes Award for Health Education.—The "Elizabeth Severance Prentiss Award for Outstanding Contributions to Health Education" has been established by the Cleveland Health Museum in honor of Mrs. Prentiss, who in 1940 gave her childhood home to house the museum. Mrs. Prentiss died, January 4, at her home in Glenallen, Cleveland, at the age of 79. Her gifts to hospitals, including St. Luke's Hospital, Cleveland, and the Allen Hospital, Oberlin, were in memory of her first husband, Dr. Dudley Peter Allen, who died in 1915. In Cleveland, the Allen Memorial Medical Library is another institution founded by her in his memory. The first recipient of the award will be announced at the fourth annual meeting of the museum, in November 1944. The creation of the award was announced as a feature of the third anniversary of the museum, Nov. 22, 1943, at which Dr. James A. Doull, professor of hygiene and public health, Western Reserve University School of Medicine, Cleveland, spoke on

His work ranks him with his great predecessors of the Royal Society: Boyle, Hooke, Mayow, Lower, Hales, Priestley and John Scott Haldane, who received the Copley medal nine years ago. It was by the work of these men that our knowledge of the changes which occur in respiration was built up. The influence of Barcroft's researches has extended to physiologists all over the world, and they have become the starting point of further work.

PALESTINE

(From Our Regular Correspondent)

Oct. 29, 1943.

Palestine's Gift to Soviet Russia

Having overcome all the various difficulties which had for many weeks held up shipment of ambulances and medical supplies to Soviet Russia, the V League in Palestine was able recently to dispatch a second shipment to Teheran. The first shipment contained quantities of bromides, absorbent cotton and vaccines, while the second included (1) three ambulances, one of them being a mobile field hospital, each complete with medical and sanitary equipment for 14 beds (the equipment consisting of 42 articles totaling 1,280 items), (2) 1 ton of bromides, (3) two hundred thermometers, (4) sets of surgical instruments, (5) olive oil and phenolated soap, (6) two typewriters and (7) two fonts of linotype intended for use by the Jewish Anti-Fascist Committee in Kubeishov. The two typewriters are the gift of the General Federation of Jewish Labor in Palestine. The linotype equipment is the gift of the V League in Palestine.

Tuberculin Test of All Personnel Engaged in Children's Houses

The Anti-Tuberculosis League, the Hadassah Medical Association and the Kupat Holim (Workers' Sick Fund of the General Federation of Jewish Labor in Palestine) have recently intensified their efforts to combat tuberculosis in this country. An investigation was conducted by two Kupat Holim physicians, Dr. Hupert and Dr. Nassau, in the agricultural cooperative settlements among personnel in charge of the care and health of children, which revealed that 94.2 per cent were completely healthy, 2.7 per cent had inactive tuberculosis, another 2.7 per cent, though affected and in need of observation, did not require treatment, and 0.4 per cent were tuberculous and did require treatment. This proportion of affected persons is somewhat lower than in other countries, according to the published figures. The reason probably lies in the fact that the bulk of the persons examined in this investigation had been living a rural life for a considerable time and that their ages ranged between 16 and 30.

Bean Disease (Favism)

Favism is a disease which appears in the form of typical attacks of acute hemolytic anemia. Whenever a particularly sensitive person comes into contact with fave beans—at present their pathogenicity is explained by the allergic theory—he shows signs of the disease, either as the result of having eaten the beans or of having inhaled the pollen at the time of flowering. The pathogenic principle remains in the dried bean as well, even after prolonged cooking.

The first case of favism here was brought before Dr. Shieber at Beilinson Hospital, a Kupat Holim institution. Later, Dr. Robinson reported 3 cases seen in the Hadassah Hospital, and Dr. Genezzani of the Children's Department in the Hadassah Hospital in Tel Aviv has recently published an article in *Refuah* on 10 cases which he has treated in the past three years.

The disease was known in ancient times in all Mediterranean countries, but systematic, scientific investigation did not begin until the second half of the last century. Physicians of the Italian islands of Sardinia and Sicily were the first to carry

out these investigations and thought that the disease was restricted only to these places. But with the increased interest in favism among the physicians of other countries it was found that the disease is spread to all Mediterranean countries, including Palestine.

Statistical investigations showed that the disease affects chiefly males (80 per cent), that it is chiefly a disease of children, that most cases occur in the spring, that it is more common among certain races (Arabs and related races, Sephardic Jews, Yemenites) than others, and that, finally, it has some connection with malaria.

The disease usually has a benign course; the attack passes in about a week with complete recovery by means of active regeneration of the hemolyzed blood, though fatal cases have been reported. The most effective form of treatment is blood transfusion.

Scientific Conferences

At an all Palestine Conference of Children's Doctors, which took place in March, the principal subjects under discussion included chemical treatment of stomach and intestinal diseases in children, allergic skin diseases in children, bronchial asthma in children, cryptorchism and problems of toxicosis. A number of military doctors participated in the discussion and read papers on infectious diseases of the brain in children and neurosis in children. The lectures on chemical treatment of stomach and intestinal diseases emphasized the great value of sulfathiazole and sulfaguanidine in the treatment of diarrhea and toxicosis in children. Mortality among children from this disease has dropped from 50 per cent to 11.7 per cent as a result of these drugs. The doses were 0.1 Gm. per kilogram of the patient's weight daily for a period not exceeding five to eight days.

In June 1943 a Dermatologists' Conference was held, and the main subjects discussed were, among others, the physiology of the vitamin B complex, avitaminosis, allergy of the skin, the treatment of syphilis and leishmaniasis of the skin.

Shortage of Physicians and Nurses in Palestine

The shortage of physicians and nurses has recently become acute. One of the main reasons for this situation is the fact that many have volunteered for the various military services. Up to the present time, over two hundred Jewish doctors have joined the British army, and many more are waiting to be called.

Jewish doctors in Palestine are enlisting for all the services, including combatant units, as well as for service throughout the British Empire, Abyssinia, India and elsewhere. The volunteers include a large number of physicians on the permanent staffs of Kupat Holim and Hadassah. Twenty-five of these were attached to Kupat Holim alone.

The shortage of nurses, and particularly of midwives, is even more serious. The nonavailability of nurses is seriously impeding the extension of medical institutions, especially of Kupat Holim, which has opened new wings during the past year (30 surgical beds at Petach Tikva, 30 beds for maternity cases in Rehovoth, a new children's department of 40 beds in the Afuleh Hospital and the addition of 20 beds to the department for internal diseases at the Beilinson Hospital).

The nurses' schools attached to the Hadassah and Beilinson hospitals have accepted an increased number of students, and a number of new schools for nurses will shortly be opened in other hospitals. In the meantime the medical institutions are compelled to take on some nonqualified nurses.

The large scale enlistment of the Jewish community in Palestine (20,000 soldiers and A. T. S. serving with the army and 10,000 in the defense forces of Palestine) has made itself felt in all spheres of life and work in the country. Not only professions and trades but even unskilled labor are affected. Nevertheless the people, and among them the physicians, continue to volunteer.

Deaths

Alexander Earle Horwitz, St. Louis; Washington University School of Medicine, St. Louis, 1904; instructor in orthopedic surgery, St. Louis University School of Medicine, from 1910 to 1913, assistant professor from 1913 to 1933 and since the latter year associate professor of orthopedic surgery; member of the Clinical Orthopaedic Society and the American Academy of Orthopaedic Surgeons; fellow of the American College of Surgeons; major, medical reserve corps, U. S. Army, not on active duty; assistant orthopedic surgeon, O'Fallon Dispensary, from 1908 to 1910, and the Washington University Hospital, 1909-1910; orthopedist, St. Louis City Hospital, since 1910 and Rebekah Hospital from 1910 to 1914; associate orthopedist, St. John's Hospital, from 1912 to 1926 and since 1926 orthopedist; visiting orthopedist, Robert Koch Hospital; orthopedist, St. Anthony's Hospital from 1921 to 1928 and St. Mary's Group of Hospitals since 1924; director of orthopedics, St. Louis City Hospital for the Colored, since 1935; assistant orthopedic surgeon from 1911 to 1916 and since 1927 associate orthopedist, Jewish Hospital, where he died November 30, aged 65, of pyelonephritis.

Georgine Maria Luden ✶ Victoria, B. C., Canada; Ludwig-Maximilians-Universität Medizinische Fakultät, Munich, Bavaria, Germany, 1912; member of the Minnesota State Medical Association, American Association for Cancer Research, Association for the Study of Internal Secretions, Medical Women's International Association, American Association for the Advancement of Science, International Association of Medical Museums and the Association of Resident and ex-Resident Physicians of the Mayo Clinic; formerly associate in cancer research at the Mayo Clinic, Rochester, Minn.; received a Ph.D. in pathology from the University of Minnesota in 1920; died November 20, aged 68, of carcinoma of the lung and tuberculosis.

Charles Curtis Jones ✶ Cincinnati; Ohio-Miami Medical College of the University of Cincinnati, 1910; specialist certified by the American Board of Otolaryngology; at one time assistant professor of otolaryngology at the University of Cincinnati College of Medicine; member of the American Academy of Ophthalmology and Otolaryngology and the American Laryngological, Rhinological and Otolological Society; fellow of the American College of Surgeons; in charge of the medical division of civilian defense for Norwood and for many years a member of the board of health; served on the staffs of the Christ Hospital, Children's Hospital and the Bethesda Hospital, where he died November 22, aged 56, of pneumonia.

Dexter D. King ✶ York, Neb.; University of Nebraska College of Medicine, Omaha, 1914; past president of the Nebraska State Medical Association and the York County Medical Society; for one year honorary president of the Elkhorn Valley Medical Association; formerly councilor of the Sixth District Medical Society; served during World War I; for one term a member of the school board; affiliated with the York Clinic; on the staff of the Lutheran Hospital; president of the local Rotary Club, 1930-1931; served as a national director of the alumni association of the University of Nebraska; died November 27, aged 59, of cardiovascular renal disease.

George Buchanan Kryder ✶ Glendale, Calif.; University of Illinois College of Medicine, Chicago, 1920; specialist certified by the American Board of Pediatrics, Inc.; member of the American Academy of Pediatrics; child hygiene physician, health department of Los Angeles County; served in the medical corps of the U. S. Army during World War I; on the staffs of the Los Angeles County and Children's hospitals, Los Angeles, Physicians and Surgeons Hospital and the Glendale Sanitarium and Hospital; died November 19, aged 50, of coronary thrombosis.

Franklin Davis Wilson ✶ Norfolk, Va.; University of Maryland School of Medicine, Baltimore, 1908; specialist certified by the American Board of Pediatrics, Inc.; member of the American Academy of Pediatrics; fellow of the American College of Physicians; past president of the Norfolk County Medical Society; also a pharmacist; at one time a member of the county school board; on the staffs of the St. Vincent's Hospital, Leigh Memorial Hospital and the Norfolk General Hospital, where he died November 17, aged 61, of cerebral hemorrhage.

James Anthony Bach ✶ Milwaukee; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1884; formerly professor of ophthalmology and otology, Wisconsin

College of Physicians and Surgeons and the Marquette University School of Medicine; fellow of the American College of Surgeons; served on the staff of St. Mary's Hospital, where he died November 29, aged 83, of cerebral thrombosis.

Orrie Hugh Ball, Dennis, Kan.; University Medical College of Kansas City, Mo., 1900; member of the Kansas Medical Society; on the staffs of the Mercy Hospital, Parsons, and the Johnson Hospital, Chanute; died November 2, aged 72, of generalized arteriosclerosis.

Roger Biswell, Baker, Ore.; Willamette University Medical Department, Salem, 1906; member of the Oregon State Medical Society; served during World War I; on the staff of St. Elizabeth Hospital, where he died November 12, aged 62, of angina pectoris.

Walter T. Christensen, Seattle; Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1905; member of the Washington State Medical Association; for five terms a member of the state legislature; formerly on the staffs of the Providence and Columbus hospitals; died November 10, aged 65, of cerebral hemorrhage.

Walter Roy Liddell Coakley, Buffalo; Albany (N. Y.) Medical College, 1913; on the staff of Our Lady of Victory Hospital, Lackawanna; died November 3, aged 57, of cirrhosis of the liver.

Lewis Morgan Daniel ✶ Minneapolis; University of Minnesota Medical School, Minneapolis, 1923; formerly secretary-treasurer of the Hennepin County Medical Society; served on the staff of the Abbott Hospital; died in Pompano, Fla., November 23, aged 49, of aortic stenosis.

William Dietz, Rockford, Wash.; Atlanta College of Physicians and Surgeons, 1902; died October 15, aged 66, of pulmonary edema and hypertensive heart disease.

George W. Fahrenbach, Bernville, Pa.; Baltimore (Md.) Medical College, 1900; member of the Medical Society of the State of Pennsylvania; member of the county and borough school boards and the local draft board; died November 13, aged 70, of carcinoma.

Elman Parker Felch, Centerville, Mich.; University of Michigan Homeopathic Medical School, Ann Arbor, 1893; died November 8, aged 76, of uremia.

Eldon Marshall Findley ✶ Graham, Mo.; Harvard Medical School, Boston, 1916; formerly instructor in physiology at the University of Missouri School of Medicine, Columbia; on the staff of St. Francis Hospital, Maryville; died November 18, aged 62, of coronary thrombosis.

Arthur Emile Gadbois, Norfolk, Neb.; John A. Creighton Medical College, Omaha, 1903; member of the American Academy of Ophthalmology and Otolaryngology; specialist certified by the American Board of Otolaryngology; served as ophthalmologist for the Chicago and Northwestern Railway Company; a captain in the medical corps of the U. S. Army during World War I; on the staffs of the Lutheran and Our Lady of Lourdes hospitals; died November 19, aged 68, of coronary embolism.

James Arthur Gage, Lowell, Mass.; Harvard Medical School, Boston, 1885; member of the Massachusetts Medical Society and the New England Surgical Society; fellow of the American College of Surgeons; member of the House of Delegates of the American Medical Association in 1908 and 1910; served on the staff of the Lowell General Hospital; died November 29, aged 85, of pneumonia.

John Augustus Herring ✶ St. Petersburg, Fla.; University of Michigan Medical School, Ann Arbor, 1916; member of the Radiological Society of North America, Inc.; served as chief of staff, St. Anthony's Hospital; died November 17, aged 52, of coronary occlusion.

John Inglis ✶ Denver; Ohio Medical University, Columbus, 1895; Rush Medical College, Chicago, 1896; formerly member of the state board of medical examiners; author of "Chemistry in Abstract" (Encyclopedia Americana), Peking, 1906; on the staffs of the Mercy Hospital, St. Luke's Hospital and the Porter Sanitarium and Hospital, where he died November 20, aged 74, of pneumonia.

John Barlow James ✶ Page, N. D.; Northwestern University Medical School, Chicago, 1911; elected president of the Cass County Medical Society; served on the staffs of the Mercy Hospital, Valley City, Union Hospital, Maysville and St. John's Hospital, Fargo; died November 8, aged 56, of hypertension and cerebral hemorrhage.

William K. Jones, Wilmore, Ky.; Hospital College of Medicine, Louisville, 1897; member of the county health board; died in the Good Samaritan Hospital, Lexington, November 10, aged 71, of carcinoma of the prostate.

Jule Harrison Keller ☉ Lancaster, Mo.; Central Medical College of St. Joseph, 1900; served as county health officer; for six years county coroner; died November 23, aged 66, of heart disease.

Harry Thomas King, Minneapolis; Marquette University School of Medicine, Milwaukee, 1924; member of the Minnesota State Medical Association; examining physician, Hennepin County local draft board number 17; on the staff of the Lutheran Deaconess Home and Hospital; on the advisory board, member of board of governors and on the staff of St. Mary's Hospital, where he died October 10, aged 48, of fibrillation of the heart.

Lovick Pierce Longino, Milledgeville, Ga.; Atlanta College of Physicians and Surgeons, 1905; member of the Medical Association of Georgia and the American Psychiatric Association; recently resigned as superintendent of the Milledgeville State Hospital; died in the Emory Hospital, Atlanta, November 20, aged 64, of coronary occlusion.

Edwin Horner Lowe, Maryville, Tenn.; Medical Department of the Western University of Pennsylvania, Pittsburgh, 1892; member of the Medical Society of the State of Pennsylvania; veteran of the Spanish-American War; for many years physician for the Aluminum Company of America at Alcoa; died November 8, aged 73, of leukemia and intestinal hemorrhage.

Max Lubman, New York; Cornell University Medical College, New York, 1900; member of the American Academy of Ophthalmology and Otolaryngology; served in the outpatient department of the Mount Sinai Hospital; died November 20, aged 67, of coronary thrombosis.

Frederick Joseph Mayer, Opelousas, La.; Medical Department of Tulane University of Louisiana, New Orleans, 1883; member of the Louisiana State Medical Society and president, 1913-1914; served as president of the Attakapas Medical Society, the oldest medical society in the state, in 1885; formerly special medical inspector for the Louisiana and Texas state boards of health; died December 1, aged 84.

William Taylor Miles, Louisville, Ky.; Louisville Medical College, 1892; member of the Kentucky State Medical Association; on the visiting staffs of St. Anthony's Hospital, Methodist Deaconess Hospital and the SS Mary and Elizabeth Hospital, where he died November 7, aged 75, of uremia.

James R. Miller, Stowell, Texas; Memphis (Tenn.) Hospital Medical College, 1897; died November 11, aged 75, of carcinoma of the neck and face.

Frederick R. Moessner, Madison, Wis.; Northwestern University Medical School, Chicago, 1904; died November 22, aged 66, of heart disease.

David Hubbell More, Long Beach, Calif.; Columbia University College of Physicians and Surgeons, New York, 1907; member of the California Medical Association; died in Beverly Hills, November 4, aged 65, of uremia due to carcinoma of the bladder.

David Hervey Morgan, Akron, Ohio; University of Wooster Medical Department, Cleveland, 1896; secretary of the Summit County Medical Society in 1912, vice president in 1913 and president in 1914; died in the Fair Oaks Villa Sanitarium, Cuyahoga Falls, November 11, aged 78, of cerebral hemorrhage.

Carlton D. Morris, Pontiac, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1894; at one time assistant in physiologic chemistry at his alma mater; formerly president of the Rotary Club; served on the staff of the Pontiac General Hospital, where he died November 28, aged 73, of carcinoma of the sigmoid with metastases.

Ralph Edward Munden, Cedar Rapids, Iowa; Milwaukee Medical College, 1909; member of the Iowa State Medical Society; died November 15, aged 56, of pneumonia and peritonitis.

Eryl Smith Peterson ☉ Jackson, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1907; served during World War I; past president of the Jackson County Medical Society; a member of the board of directors of the Ben Franklin Savings and Loan Association; died in Bradenton, Fla., November 17, aged 60, of coronary occlusion and arteriosclerosis.

William Peter Reckley, Youngstown, Ohio; Eclectic Medical College, Cincinnati, 1928; member of the Ohio State Medical Association; died in the Youngstown Hospital, North Side Unit, November 29, aged 40, of carcinoma.

Thomas Wesley Rennie, Chicago; Chicago College of Medicine and Surgery, 1917; died in the Veterans Administra-

tion Facility, Hines, Ill., November 29, aged 69, of hypertensive and coronary arteriosclerotic heart disease.

James Micaga Ringo, Houston, Texas; University of Louisville (Ky.) Medical Department, 1887; died October 28, aged 84, of pneumonia.

George Clovis Robert, Rossford, Ohio; McGill University Faculty of Medicine, Montreal, Que., Canada, 1897; served during World War I; formerly fire commissioner, and city physician of Holyoke, Mass.; at one time on the staffs of the Holyoke and Providence hospitals, Holyoke; died November 5, aged 70, of intestinal obstruction.

Isaac Poitevint Robinson, Shreveport, La.; Baltimore Medical College, 1897; at one time on the staff of St. Joseph's Hospital, Baltimore; died in a local sanatorium November 25, aged 82, of injuries and shock received when struck by a truck.

John Paul Rutherford, Bennington, Okla.; Chattanooga (Tenn.) Medical College, 1903; veteran of the Spanish-American War; died October 31, aged 63.

Gordon Joel Saxon ☉ Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1908; died in Carbon Run, Pa., October 20, aged 64, of cirrhosis of the liver.

James Edgar Shepherd, Hope Mills, N. C.; University of Louisville (Ky.) Medical Department, 1885; veteran of the Spanish-American War; died in the Presbyterian Hospital, New York, November 16, aged 81, of senile cataract and bronchopneumonia.

Louis Sam Smith ☉ Brooklyn; Long Island College Hospital, Brooklyn, 1920; specialist certified by the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology; died October 23, aged 47, of brain tumor.

David Emmet Stafford, San Francisco; University of California Medical Department, San Francisco, 1903; member of the California Medical Association; for many years on the staff of St. Joseph's Hospital; died September 24, aged 65, of coronary disease.

Augustus Willard Tarr ☉ Johnston City, Ill.; Barnes Medical College, St. Louis, 1898; died November 23, aged 78, of cerebral hemorrhage.

Augustus Jerome Thomas, Shreveport, La.; Medical Department of Tulane University of Louisiana, New Orleans, 1900; died October 31, aged 65.

Sidney Welles Thompson, Owego, N. Y.; University of the City of New York Medical Department, New York, 1896; member of the Medical Society of the State of New York; formerly mayor and village president; served during World War I; died in the Tioga County General Hospital, Waverly, October 29, aged 70, of cerebral thrombosis and arteriosclerosis.

DIED WHILE IN MILITARY SERVICE

Seale Harris Jr., Birmingham, Ala.; Johns Hopkins University School of Medicine, Baltimore, 1926; member of the Medical Association of the State of Alabama and the American Society for Clinical Investigation; fellow of the American College of Physicians; at one time assistant professor of medicine at the Vanderbilt University School of Medicine, Nashville, Tenn.; served as visiting physician at the Hillman and Baptist hospitals; major, medical corps, Army of the United States; for seven months head of an army base hospital in the Fiji Islands; second in command of an army base hospital in Brisbane, Australia; died in Brisbane, December 22, aged 43, of heart disease.

Joseph Eugene Seliady, Northville, Mich.; Detroit College of Medicine, 1932; member of the Michigan State Medical Society; served on the staff of the East Lawn Sanatorium; commissioned a captain in the medical corps, Army of the United States, on May 21, 1942 and recently promoted to major; died in Fort Sam Houston, Texas, November 19, aged 41, of peritonitis resulting from a bite.

Charles LaFayette Stevens ☉ Elmira, N. Y.; University of Buffalo School of Medicine, 1927; diplomate of the National Board of Medical Examiners; commissioned a lieutenant in the medical corps of the U. S. Naval Reserve on Feb. 11, 1941 and lieutenant commander on Oct. 1, 1942; died in the U. S. Naval Hospital, Pensacola, Fla., November 19, aged 39, of acute yellow atrophy of the liver.

Correspondence

"HAZARDS OF EXPOSURE TO GLASS" WOOL, GLASS FRIT OR FOAM GLASS"

To the Editor:—This letter is written to comment on the inquiry from Dr. Jean Henderson and the answer regarding hazards of exposure to "glass wool" or "fiber glass," published in *Queries and Minor Notes* in *THE JOURNAL*, May 1, page 69.

The first fibrous glass made in the United States on a commercial scale was produced in my own state in 1934, in what are now the Newark, Ohio, factories of Owens-Corning Fiberglas Corporation. Since 1934 fibrous glass in the wool-like form commonly called glass wool has been produced continuously in these factories.

As chairman of the Committee on Industrial Health of the Ohio State Medical Association and as medical consultant for Owens-Corning Fiberglas Corporation, I have considerable personal knowledge of the health aspects of the manufacture of fibrous glass and of investigations in this field by independent medical authorities.

I do not have similar knowledge of the manufacture of foam glass or of the production of glass frit, but I do know that the processes are quite unrelated to those used in the manufacture of glass fibers or glass floss—the subject of Dr. Henderson's inquiry. Although the material sold as glass floss is not manufactured by the Fiberglas Corporation, the reply to Dr. Henderson embraces the whole range of products made of glass fibers and therefore comes within the scope of my experience.

This knowledge leads me to believe that that part of the answer which pertains to the health hazards of glass wool may be misleading to readers. In an effort to clear up any misconceptions which the answer may have been responsible for, I should like to review and comment on certain of the statements made in it.

The answer correctly states that the process of manufacture of glass fibers differs with the ultimate use contemplated for the fibers, but the description of the process employed in the manufacture of fibers for the wool-like form of fibrous glass is correct only for one type of glass textile fibers and is completely incorrect for fibers fabricated into the wool-like form—the material to which both question and answer refer.

This is unimportant, but the answer then lists the following as specific exposures: (1) the usual ill effects of high temperatures; (2) mechanical injuries from spicules of glass; (3) carbon tetrachloride or ether vapors, which chemicals are sometimes used to remove a mineral oil lubricant, at times applied to the glass fibers to promote disentanglement.

Exposure to high temperatures is common in a great number of manufacturing processes. In many industries it is almost as much a concomitant of factory work as is exposure to the heat of the sun a concomitant of the farmer's labor. Such exposure can become a hazard only under exceptional circumstances. No such exceptional circumstances are present in the manufacture of fibrous glass, and I have never before heard it suggested that exposure to high temperatures constitutes a hazard for such workers.

From time to time newly employed workers, unaccustomed to handling fibrous glass, have experienced a short period of discomfort due to a nondisabling and superficial mechanical irritation of the skin caused by spicules of glass. Such discomfort has usually lasted only a few days, passing as soon as the worker became used to handling the material.

During the spring and summer of 1942 Dr. Marion B. Sulzberger, assistant clinical professor of dermatology and syphilology,

New York Post-Graduate Medical School, and Dr. Rudolf L. Baer, junior assistant dermatologist and syphilologist, New York Post-Graduate Hospital, carried out an experimental investigation of the effects of fibrous glass on the skin of laboratory animals and human volunteers.

Summarizing the results of the investigation, Dr. Sulzberger and Dr. Baer say:

All of the reactions observed were of a transitory and superficial nature. The only part of the reactions which persisted for more than a few days were slight thickening and brownish pigmentation of the skin. The latter were sometimes apparent for several weeks. No reactions or symptoms outside the rubbed skin areas were observed at any time during the experiment.

The pieces of material which were seen sticking into the skin after rubbing with Fiberglas in its wool-like form appeared to be very superficially embedded. This observation was borne out by the fact that ordinary washing with water easily removed a large part of the spicules remaining in the skin after rubbing.

A full report of the Sulzberger-Baer investigation was published in *Industrial Medicine* (11:482 [Oct.] 1942).

Neither carbon tetrachloride nor ether vapors are used for any purpose at any stage in the manufacture of fibrous glass in any of its forms. The manufacturers of fibrous glass supply other manufacturers with various fibrous glass products for incorporation in products which these manufacturers produce. For some highly specialized applications some of these other manufacturers may wish to remove the lubricant that is applied to glass fibers during the manufacturing process to prevent them from abrading one another, not, as *THE JOURNAL* answer states, "to promote disentanglement." Removal of the lubricant is rarely required.

Carbon tetrachloride or ether vapors are among the solvents that may be used to remove the lubricant from the fibers. Their employment, however, has no more connection with the manufacture of glass fibers and fibrous glass products than has the removal of paint from a chair to do with the manufacture of the chair.

THE JOURNAL answer states that it is doubtful whether any specific pneumoconiosis is likely to arise from working with glass wool. That no such pneumoconiosis can arise is indicated by the following statement by Dr. Leroy U. Gardner, director of the Edward L. Trudeau Foundation for Research and Teaching in Tuberculosis:

Exposure to the dust of glass wool, a material commonly used to insulate buildings, involves no hazard for the lungs because this fibrous material is not inhalable.

This statement by Dr. Gardner appeared in the 1941 report of the director of the Trudeau Foundation and followed an investigation of the effects of exposure to glass wool dust conducted by Dr. Gardner over a period of several years.

Finally, I should like to point out that no claim for workers' compensation based on a pulmonary industrial disease, or disability resulting from an occupational skin disorder attributable to fibrous glass as differentiated from other materials, has ever been validated in the state of Ohio, where manufacture has been centered since 1934.

A list of references is appended.

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Fibrous Glass Insulation: Health Aspects of, Memorandum dated Dec. 30, 1942 from the Chief of the Bureau of Ships and the Chief of the Bureau of Medicine and Surgery, Navy Department, to The Commandants, All Naval Districts; The Commandants, All Navy Yards; All Supervisors of Shipbuilding, U.S.N.; The Commanding Officers All Tenders and Repair Ships; All Industrial Managers, U.S.N. References: (a) BUSHIPS 1 tr. S38-1(3638) of Nov. 23, 1942. (b) BUMED 1 tr. FS/S38-1(103) of Dec. 18, 1942.

B. J. HEIN, M.D., Toledo, Ohio.

INTENSIVE TREATMENT OF SYPHILIS

To the Editor:—I have recently observed a case of clinical and serologic relapse occurring within one month after the patient had been given the five day treatment for syphilis under the direction of an officer of the United States Public Health Service. I have been informed of a probable neurorelapse following the administration of penicillin in a case of early syphilis. I am reminded also of the epidemic of early neurosyphilis which occurred in Europe almost immediately following the introduction of arsphenamine.

When we consider the action of some of our newer chemical compounds, including penicillin, which are used in the treatment of early syphilis and some of which, like penicillin, gain access slightly if at all to the cerebrospinal fluid, we should keep in mind the early experience with arsenicals. Every effort should also be made to guard against those previous disastrous results, particularly in view of the fact that, had we known then what we know now, most of the hundreds of cases which occurred in 1910-1912 could easily have been prevented. (For references see the several books on arsphenamine edited by Ehrlich as well as numerous articles on the neurorecidiv which appeared in European medical journals of that period. Also the collection of 212 cases published by Bernario in 1911 in the book *Ueber Neurorecidiv*. Not all of the cases collected by Bernario followed the administration of arsphenamine.)

Many will recall the heated discussion which took place between the Vienna school headed by Professor Finger and the Berlin group led by Professor Ehrlich concerning this matter. The question was definitely settled in 1913. Without entering into a lengthy discussion of the facts which settled the dispute, since that would lead to detailed consideration of *Treponema pallidum*, as well as the question of immunity in syphilis and the adequate treatment of the disease, suffice it to say that the cause of the appearance of so many cases of early neurorelapse was the inadequacy of the treatment of the infection and not the direct action of the arsenical, as Professor Finger first maintained.

The crux of the matter is that, if early syphilis is to be treated efficiently, it should be treated not only with a view to arresting its infectiousness, which obviously is of major importance, but also with a view to the protection of the future of the individual per se.

Our newer remedies offer the prospect that the infectiousness can be checked promptly, but they do not offer a certain pros-

pect that complete sterilization can be produced. Indeed, it appears from the properties and actions of some of these chemical agents quite probable that they will not completely sterilize, when we consider the pathogenesis of the disease process and the fact that these drugs, by rapidly destroying many of the organisms, do by this action materially lower a very essential factor in cure—the patient's immunity.

The general practitioner, who must of necessity treat the disease, and the syphilologist, who treats a limited number of cases, should proceed cautiously in adopting any of the newer methods until the larger facilities have more definitely determined the real worth of these methods. Although it will take some time before this can be settled, combined chemotherapy and fever may be at least one of the means of effecting an early biologic cure. The former, although powerfully treponemocidal, indirectly suppresses immunity, while the latter enhances it.

Let us not make the identical mistake which Professor Ehrlich made in the early part of the arsphenamine period. It will be forever to his credit, however, that he was the first to recognize this mistake and to correct it. In other words, if we are to use any of the various "rapid cures," let us strive actually to cure by as safe a procedure as possible and by a close and careful follow-up, if we use a method that we know retards or prevents the patient's immunity. Already too many patients have been sacrificed.

It is not probable that a great number of cases will appear, since most of the new methods are more efficient than a dose or two of arsphenamine, which was largely responsible for the early outbreak. As we now know the cause and the prevention, we are equipped to forestall a recurrence of a disastrous episode.

WILLIAM H. HOUGH, M.D., Washington, D. C.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

BOARDS OF MEDICAL EXAMINERS BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in *THE JOURNAL*, Jan. 1, page 123.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: *Parts I and II*. Jan. 17-19. *Part III*. Various centers, January. Sec., Dr. J. S. Rodman, 225 S. 15th St., Philadelphia.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY: *Oral. Part II*. Chicago, June 12-16. Final date for filing application is March 12. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Written*. Various large cities, May 8. *Oral*. Chicago, June 9-10. Final date for filing application is April 1. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Part II*. June 7-13. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh 6, Pa.

AMERICAN BOARD OF OPHTHALMOLOGY: Chicago, Oct. 5-7. Sec., Dr. S. Judd Beach, P. O. Box 1940, Portland, Me.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: *Written and Oral. Part II*. Chicago, Jan. 21-22. Sec., Dr. Guy A. Caldwell, 3503 Prytania St., New Orleans, La.

AMERICAN BOARD OF OTOLARYNGOLOGY: *Oral*. New York City, June 1-4. Sec., Dr. Dean M. Lierle, University Hospitals, Iowa City, Ia.

AMERICAN BOARD OF PEDIATRICS: *Written*. Locally, Feb. 4. *Oral*. Philadelphia, March 25-26, and San Francisco, May 6-7. Sec., Dr. C. A. Aldrich, 115½ First Ave. S.W., Rochester, Minn.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: *Written*. Various centers, March 31. Sec., Dr. Walter Freeman, 1028 Connecticut Ave. N.W., Washington, D. C.

AMERICAN BOARD OF UROLOGY: *Oral*. Chicago, Feb. 15-17. Sec., Dr. Gilbert J. Thomas, 1409 Willow St., Minneapolis.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Dental Practice Acts: Validity of Board's Rules Respecting Advertising.—The Michigan state board of dentistry adopted six rules, in the main prohibiting the splitting of fees and regulating advertising by licensed dentists. Several licensed dentists, including the plaintiff, Toole, filed suit to prevent the board from enforcing those rules, alleging that the rules were null and void because they either exceeded the power granted the board by the dental practice act or, if authorized by the act, were the result of an unlawful delegation of legislative power to the board. The Michigan state dental society intervened in the action. The trial court dismissed the suit, and the plaintiffs appealed to the Supreme Court of Michigan.

In testing the right of the board to adopt the rules in question, said the Supreme Court, it must be borne in mind that the Michigan dental practice act puts the practice of dentistry under the supervision of the board and gives it the power to "adopt rules and regulations for its own organization and for the practice of dentistry . . . and for carrying out the provisions of this act." We must also be guided by our previous decisions germane to the construction of the act in this regard. For instance, in *Argo Oil Corporation v. Atwood*, 274 Mich. 47, 264 N. W. 285, we said:

It is too well settled to need the citation of supporting authorities that the Legislature, within limits defined in the law, may confer authority on an administrative officer or board to make rules as to details, to find facts, and to exercise some discretion, in the administration of a statute.

Again, in *Sullivan v. Michigan State Board of Dentistry*, 268 Mich. 427, 256 N. W. 471, we said:

It is not to be presumed that the board will adopt any rules and regulations for the practice of dentistry that do not meet the test of constitutionality.

We must also remember, as was said in *Johnston v. Board of Dental Examiners*, 77 U. S. App. D. C. 119, 134 F. (2d) 9, that

The regulations of the Board are valid so long as they are not unreasonable or arbitrary. If any doubt exists as to their invalidity, they must be upheld.

The first rule adopted by the board in effect prohibited any person from splitting or dividing with any other dentist or layman any fees earned in rendering any dental service, provided that the rules should not be interpreted to prevent an employer from paying an employee. The plaintiffs claimed that the enforcement of this rule would prevent partnerships in the practice of dentistry. It is to be noted, said the Supreme Court, that the dental practice act prevents the practice of dentistry by corporations, but nowhere in the act do we find such practice by partners prohibited, nor do we interpret the first rule as preventing such practice by partners. The rule was aimed at the splitting of fees between dentists or between a dentist and a layman. We do not find the rule running counter to the purposes of the framers of the legislation.

The second rule adopted by the board of dentistry prohibited a dentist from using a sign employing a background of more than 300 square inches or using letters thereon of a size greater than 5 inches. Section 17 of the dental practice act, said the court, makes it unlawful to advertise by means of large display signs, or glaring light signs, electric or neon, or such signs containing as part thereof the representation of a tooth, teeth, bridgework, plates of teeth or any portion of the human head, or to use specimens of such in display, directing the attention of the public to any such person or persons engaged in the practice of dentistry. In *Modern System Dentists v. State Board of Dental Examiners*, 216 Wis. 190, 256 N. W. 922, it was held that a rule prescribing a maximum of 600 square inches for a dentist's sign outside his office building and the maximum size of letters thereon was within the authority of the state board. In our opinion a rule that permits a maximum of 300 square inches is a matter that lies in the sound discretion of the rule making body and is within the power granted by the statute.

The third rule adopted by the board prohibited the use of more than one outside sign. We are in accord, said the Supreme Court, with the reasoning of the trial court in upholding this rule:

Several signs placed in juxtaposition to one another would constitute one large sign, and the regulation dealing with size would be a nullity if it permitted the dentist to accomplish through multiplicity of signs the effect which is denied through a single sign.

The fourth rule adopted by the board prohibited a dentist from using illumination on a sign other than that of the indirect type or of a type lighted from within and limited the illumination to no greater intensity than that provided by 100 watts of incandescent lighting or its equivalent, provided further that no colored illumination should be used nor any exposed luminous tube, nor any flasher, nor any intermittent mechanism be employed, provided also that no signs should be illuminated except during the time that the dentist or his associates are actually in the dental office and prepared to render service. It is evident, said the court, that this rule is intended to prevent all-night illumination. We are not in accord with the claim of the plaintiffs that this rule prevents a dentist from leaving the sign operating if he temporarily leaves his office. The legislature has provided that a dentist may not advertise by "glaring light signs, electric or neon." The rule as adopted by the board is in harmony with the intent and purpose of the dental practice act.

The fifth rule adopted by the board prohibited the practice of any dentist in an office where it is indicated, by sign or otherwise, that some one else owns or operates the office, with the sole exception that if a dentist has died his practice may be carried on for a period of six months under his name. The purpose of this rule, said the court, is not only to prohibit the practice of dentistry by any person whose name is not displayed on the office door or window but also to assure the public that the person whose name is so displayed is a practicing dentist in that particular location. The dental practice act provides specifically that it shall be unlawful to "make use of any advertising statements of a character tending to mislead or deceive the public." It is evident that this rule was adopted to carry out this provision of the act. In our opinion, the rule conforms to the intent and purpose of this portion of the dental practice act.

The sixth rule promulgated by the board regulated the size of professional card announcements, restricting the size of professional card announcements in newspapers or other similar circulating mediums to a space equivalent to a 2 inch column in width and 1 inch in length, with certain restrictions on the size and style of type used. The dental practice act, said the court, provides that dentists may make certain newspaper announcements. In our opinion, the sixth rule is a sound interpretation of that which the act permits and, as such, is not contrary to the necessary implications of the dental practice act. In our opinion, it was the intent of the legislature to establish the primary standard for the rule making body to follow and that the board in adopting the sixth rule has merely carried out the details in the administration of the dental practice act.

The court could find no sound basis for disturbing the rules adopted by the state board of dentistry and accordingly affirmed the decree of the trial court dismissing the action.—*Toole v. Michigan State Board of Dentistry (Michigan State Dental Soc., Intervener)*, 11 N. W. (2d) 229 (Mich., 1945).

Society Proceedings

COMING MEETINGS

- Annual Congress on Industrial Health, Chicago, February 15-16. Dr. Carl M. Peterson, 535 N. Dearborn St., Chicago 10, Secretary.
Annual Congress on Medical Education and Licensure, Chicago, February 14-15. Dr. Victor Johnson, 535 N. Dearborn St., Chicago 10, Secretary.
American Academy of Orthopaedic Surgeons, Chicago, January 22-27. Dr. Myron O. Henry, 825 Nicollet Ave., Minneapolis, Secretary.
Annual Forum on Allergy, St. Louis, Jan. 22-23. Dr. Jonathan Forman, 394 East Town St., Columbus, Ohio.
Clinical Orthopaedic Society, Chicago, January 22-26. Dr. Myron O. Henry, 825 Nicollet Ave., Minneapolis, Secretary.
Society of Surgeons of New Jersey, Atlantic City, January 27. Dr. Walter B. Mount, 21 Plymouth St., Montclair, N. J., Secretary.
Western Section, American Laryngological, Rhinological and Otolaryngological Society, Los Angeles, January 22-25. Dr. S. J. Jackson, 608 S. First Ave., Los Angeles, Chairman.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1934 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Diseases of Children, Chicago

66:471-596 (Nov.) 1943

- *Late Effects of Lead Poisoning on Mental Development. R. K. Byers and Elizabeth E. Lord.—p. 471.
 *Radioactive Iodine Studies in Childhood Hypothyroidism. J. G. Hamilton, M. H. Soley, W. A. Reilly and K. B. Eichorn.—p. 495.
 Regulation of Level of Vitamin A in Blood of Newborn Infants. J. M. Lewis, O. Bodansky and L. M. Shapiro.—p. 503.
 Effect of Maternal Rachitogenic Diet on Skeletal Development of Young Rat. J. Warkany.—p. 511.
 Causes of Infantile Summer Diarrhea. E. Hormacche, N. L. Surraco, C. A. Peluffo and P. L. Aleppo.—p. 539.

Effects of Lead Poisoning in Mental Development.—

According to Byers and Lord it has not been generally recognized that lead poisoning occurring in early life usually has a disastrous effect on mental development. They present a follow-up study of 20 school children who had been hospitalized in infancy or early childhood because of lead poisoning. None of them exhibited striking evidence of encephalopathy during their primary admission, and all were adjudged to have made a complete recovery from lead poisoning when discharged from the original hospitalization. The authors emphasize the length of the cycle of ingestion, storage and elimination of lead in relation to the relatively short duration of the symptoms and signs allowing a diagnosis of lead poisoning. It seems probable that lead poisoning of the sort here discussed can at present be recognized in only a small percentage of cases. Failure of the normal processes of growth and development of the cortex prevented all but 1 of the 20 children from progressing satisfactorily at school. In addition to difficulties in the general intellectual and sensorimotor spheres, other evidence of interference with the normal development of the nervous system were found. Recurrent convulsions appeared in 3 of the children, at 4, 4½ and 5½ years of age. One girl who had peripheral neuritis as a baby acquired a positive Babinski sign, and 1 boy who was discharged from the hospital as well at about 3 years of age had hyperactive reflexes and sustained clonus at the left ankle when reexamined at 9 years. Behavior difficulties were common throughout the series. Much of this behavior could be classified as "forced reaction to stimuli in the environment" described by Strauss and Werner as an evidence of cortical damage. It was apparently the result of loss of the normal inhibitory function, thought to reside in the cortex. It was usually described as unreliable impulsive behavior, cruel impulsive behavior, short attention span and the like.

Radioactive Iodine Studies in Childhood Hypothyroidism.—Hamilton and his associates stress the usefulness of radioactive isotopes of iodine in the study of iodine metabolism, pointing out that they are of particular value in measuring the gross iodine metabolism of the thyroid *in situ*. The radioactivity of a single dose of radioiodine enables one to follow its metabolic fate. The radioiodine concentrated in the thyroid may be determined quantitatively without surgical removal of the gland, since the gamma rays emitted by it penetrate the overlying tissues and can be measured with a suitable detecting device, such as the Geiger-Müller counter. Thus, the addition of a trace of radioiodine to ordinary iodine serves to label all the iodine atoms in an administered sample. The 10 children included in these studies had severe hypothyroidism. It was observed that the thyroids of children with hypothyroidism and without goiters are able to concentrate only small amounts of

orally administered iodine, as compared with the thyroids of normal children or adults. In these hypothyroid children the remaining thyroid tissue concentrated a larger percentage of a dose of 0.1 microgram than of a dose of 14 mg. of iodine. The thyroids of 2 children with goiters and with severe hypothyroidism took up relatively large amounts of iodine and by chemical analysis contained both thyroxine and diiodotyrosine in considerable quantities. The uptake curves of the thyroids as measured *in situ* were similar to those seen in hyperthyroidism in adults. Radioautographs made from sections of the thyroids of both of these children indicate that by the fifth day after the oral administration more of the iodine was in the cells than in the colloid.

American Journal of Medical Sciences, Philadelphia

206:561-700 (Nov.) 1943

- Recognition of Meningococcic Infections. P. S. Strong.—p. 561.
 Meningococcemia. E. P. Campbell.—p. 566.
 Hyperkinetic Diseases. E. Moschowitz.—p. 576.
 Use of Sulfapyrazine in Infants and Children. H. L. Barnett, Anne M. Perley, G. B. Forbes and D. Goldring.—p. 599.
 *Studies on Penetration of Sulfonamides into Skin: II. Sulfathiazole, Sulfadiazine and Sodium Sulfacetimide. E. A. Strakosch and W. G. Clark.—p. 610.
 Gastrophotography in Natural Colors in Conjunction with Gastroscopy. H. A. Rafsky.—p. 618.
 Blood Studies in Aged: Part II. Leukocytes in Aged Male and Female. B. Newman and S. Gitlow.—p. 622.
 Effect of Myxedema on Hemopoiesis in Leukemia and Related Disorders. J. T. Paul, L. R. Limarzi and L. Seed.—p. 625.
 Air Borne Cross Infection in Case of Common Cold: Further Clinical Study of Use of Glycol Vapors for Air Sterilization. T. N. Harris and J. Stokes Jr.—p. 631.
 Bone Marrow in Normal Dogs. L. M. Meyer and F. Bloom.—p. 637.
 *Toxicity of Penicillin as Prepared for Clinical Use. Dorothy M. Hamre, G. Rake, Clara M. McKee and H. B. MacPhillamy.—p. 642.
 Disseminated Necrotizing Vasculitis—Toxic Origin of Periarteritis Nodosa. M. McCall and J. W. Pennock.—p. 652.
 *Effects of Large Doses of Vitamin A Concentrate on Normal and Hypertensive Patients. R. D. Taylor, A. C. Corcoran, J. C. Shrader, W. C. Young and I. H. Page.—p. 659.

Penetration of Sulfonamides into Skin.—Strakosch and Clark performed *in vivo* experiments on guinea pigs and human beings to determine the penetration of sulfonamides from various vehicles into the skin. Skin biopsies were analyzed for total sulfonamide concentration after varying times of application. Sulfanilamide, sulfathiazole and sulfadiazine, in a comparable base at comparable concentrations and times of application, gave comparable tissue levels, demonstrating no difference in penetration into intact skin. Sodium sulfacetimide ("Albucid soluble"), on the other hand, gave greater penetration after a three day application time than the sulfonamide bases tested. Increasing the concentration did not increase the absorption by the intact skin of sulfanilamide, sulfathiazole and sulfadiazine. Even sodium sulfacetimide showed only a slight effect of concentration. Increasing the time of application increased the skin absorption of sulfonamide in all cases, especially of sodium sulfacetimide. Of seven ointment bases examined, two oil in water and five water in oil emulsions, the type of emulsion had no effect on the absorption of sulfonamide by the skin, including the sodium sulfacetimide. One water in oil emulsion was superior to the others tested. An ointment containing a solubilizer and a wetting agent in greater amounts than in the other bases studied did not give better absorption of sulfathiazole by the skin than the other bases. Injured skin absorbs much greater amounts of sulfonamides from ointments than intact skin. Sodium sulfacetimide is especially penetrating into injured skin. Injured skin absorbs sulfonamides from wet packs to a much greater extent than from ointments.

Toxicity of Penicillin.—Hamre and her associates in the course of experiments on gas gangrene observed that 7 guinea pigs which had been infected with *Clostridium perfringens* and treated subcutaneously with penicillin died, although they had shown no symptoms of gas gangrene. They had received from 2,600 to 4,000 Florey units per kilogram daily in seven doses daily for three to four days. The amounts of penicillin given to these animals were well below the toxic level for other animals, but the possibility remained that guinea pigs are

more susceptible to penicillin than other animals. To investigate this possibility, further experiments were undertaken. It was found that from 7,000 to 12,000 Florey units per kilogram daily of penicillin, as prepared for clinical use, given subcutaneously over a period of several days caused death of guinea pigs but not of mice or rabbits. However, a dose approximately that used clinically (1,000 Florey units per kilogram) given subcutaneously for twenty days did not kill guinea pigs. All animals given penicillin subcutaneously showed a severe reaction at the site of injection. Seven samples of penicillin prepared by different methods in two different places were toxic when given subcutaneously to guinea pigs for several days. Large doses of sodium ascorbate did not protect guinea pigs from the toxicity of repeated subcutaneous doses of penicillin.

Vitamin A Concentrate in Normal and Hypertensive Patients.—According to Taylor and his collaborators substances containing vitamin A, such as the nonsaponifiable fraction of butter, have been shown to increase urea and inulin clearances in normal dogs and in dogs deprived of dietary vitamin A, to increase the rate of glomerular filtration. Similarly, large doses of concentrates of the vitamin increased urea clearance in human beings. Although the increase in inulin clearance specifies the change as one associated with increased rate of glomerular filtration the mechanism of its increase remained unknown, and it is part of the purpose of this study to determine its nature. The authors also examined the effect of large doses of vitamin A concentrate in essential hypertension, since Govea, Peña and Villaverde recommended the use of the vitamin in this disease. The authors found that the administration of a preparation of vitamin A in amounts ranging from 100,000 to 400,000 units daily for from five to ninety days in 3 normotensive and 14 hypertensive patients did not alter the levels of arterial pressure. Observations of renal function in 2 normotensive and 11 hypertensive patients revealed increased effective renal blood flow in 9, increased glomerular filtration rate in 7 and increased tubular secretory capacity for diodrast in 4 of 7 hypertensive patients in whom this function was tested. The increase in effective renal blood flow was usually associated with increased cardiac output, the result of tachycardia and not of increased stroke volume. On the basis of these observations the authors arrive at the following conclusions: 1. Vitamin A concentrate is ineffective in the treatment of essential hypertension in doses of 100,000 to 400,000 units daily for from five to ninety days. 2. The vitamin concentrate causes renal vasodilatation and increased functional capacity for secretion of diodrast with increased cardiac output. The suggestion is made that it may have application in the treatment of degenerative renal diseases.

American Journal of Ophthalmology, Cincinnati

26:1135-1250 (Nov.) 1943

- Chloridermia: Nature of Condition and Case Reports R. G. Scobee.—p. 1135.
Further Observations on Autofunduscopy (Auto-Ophthalmoscopy of Eber; Purkinje Figure of Walker). L. C. Drews.—p. 1143.
Intravenous Pentothal Sodium Anesthesia in Ophthalmology. L. T. Post and E. N. Robertson.—p. 1155.
Survey of State of Ophthalmology in Philadelphia at Time of Founding of Section on Ophthalmology at College of Physicians: Personal Contribution to Celebration of Fiftieth Anniversary of Section, April 3, 1943. B. Chance.—p. 1164.
X-Ray Therapy of Inflammatory and Neoplastic Diseases of Eye. J. Borak.—p. 1170.
Parents' Role in Orthoptic Training. J. Frances Walraven.—p. 1175.
Amaurosis Following Nasal Hemorrhage: Report of Case. A. E. Long.—p. 1179.
Groenouw's Corneal Dystrophy: With Case Report and Genealogic Chart. J. O. Wetzel.—p. 1183.
Treatment of Amblyopia. F. B. Fralick.—p. 1195.
Graphic Representation of Binocular Findings. E. Krimsky.—p. 1199.
Lipemia Retinalis. M. L. Kauffman.—p. 1205.
"Through Evil, Good." G. Frey.—p. 1208.
Eyes Right and Down—Not Eyes Down and Right. T. D. Allen.—p. 1209.
Closure of Sclera After Removal of Intraocular Foreign Body by Posterior Route. W. C. Beil.—p. 1210.
New Material for Anterior-Segment Impressions. H. S. Sugar.—p. 1210.
Refraction Clinic. A. E. Sloane.—p. 1212.

American Review of Tuberculosis, New York

48:279-360 (Nov.) 1943

- *What Is the Clinical and Epidemiological Significance of Rare Bacilli in Sputum? F. M. Pottenger and J. E. Pottenger.—p. 279.
Egg Yolk-Potato Medium: Its Efficiency for Demonstrating Small Numbers of Tubercle Bacilli. K. T. Sasano and E. M. Medlar.—p. 297.
Acid Fast Bacilli in Patients of Nontuberculous Medical Service. E. M. Medlar, W. H. Ordway and G. S. Pesquera.—p. 304.
Standardization of Sedimentation Rate. J. W. Cutler.—p. 314.
Tuberculin Patch Test: Comparison with Mantoux Intracutaneous Test. B. A. Dormer, J. Friedlander, F. J. Wiles and R. Schaffer.—p. 324.
Immunization Against Tuberculo-protein (Tuberculin) Anaphylaxis. H. J. Corper and M. L. Cohn.—p. 329.
*Pneumoperitoneum: Its Scope and Limitations in Treatment of Pulmonary Tuberculosis. I. E. Rudman.—p. 334.
Ascorbic Acid in Tuberculous Navajo Indians. M. Pijoan and B. Sedlacek, with assistance by C. A. Elkin and R. L. Warren.—p. 342.

Significance of Rare Bacilli in Sputum.—The Pottengers submitted specimens of sputum from each patient to examination at intervals of from four to six weeks while under treatment and from many patients at longer intervals after discharge—in some cases for nearly fifteen years. A sterilized bottle is provided, and the patient is required to save everything expectorated. The patient is not trusted to separate lung from throat sputum. Three day specimens are required and, if the first one is negative, four or five additional specimens are collected. The sputum is examined by the dilution-flotation picric acid method and, when guinea pig inoculation is used, two thirds of the homogenized specimen or its concentrate is injected. Specimens are searched for a minimum of ten minutes (a total of about 200 microscopic fields) before they are declared negative. The authors think that acceptance of the Ziehl-Neelsen method as sufficient for determining the presence of tubercle bacilli is a cause of much inaccuracy both in diagnosis and in estimating the results of treatment; for this may show grossly positive sputum as negative. Case reports show that occasional bacilli may persist for a long time. The authors' experience indicates that, if the patient is clinically well, there is little danger from rare bacilli found by very sensitive methods, either to himself or to those with whom he associates. Sometimes larger numbers of bacilli will be temporarily discharged by one who has been clinically well, the patient returning at once to the rare or negative stage without reactivation of his disease. The persistence of bacilli occurs whether the patient has been treated by physiologic methods alone or by collapse procedures. The presence of occasional bacilli in sputum does not necessarily mean that the patient is suffering from clinically active tuberculosis, but it shows that active tuberculosis has been present. This finding may be consistent with good health and full working capacity. Patients with occasional bacilli are probably of greater danger to themselves than to those with whom they associate, because bacilli are present in the tissues and may produce endogenous spread in case the proper stimulus is present. As regards the danger to others, it would probably be greater to children than to adults, and to the less resistant than to the stronger. The presence of occasional bacilli in the sputum, as determined by exacting technics, is in the same relationship to diagnosis and cure as is the tuberculin test. It gives evidence of only limited value. The true estimate must depend on clinical judgment.

Pneumoperitoneum in Pulmonary Tuberculosis.—According to Rudman the reports on the efficacy of pneumoperitoneum in pulmonary tuberculosis ran the whole gamut of enthusiasm to pessimism. The advocates of pneumoperitoneum claim that the beneficial results brought about are due to (1) elevation of both hemidiaphragms giving rest to the diseased lung, (2) lymph stasis, which in turn promotes tissue fibrosis, and (3) pulmonary congestion and anoxemia, which in turn inhibit the growth of tubercle bacilli in the tissues and hasten reparative processes. The author shows, however, that these theoretical considerations do not always work out in practice: the mobility of the diaphragm may be impaired, subdiaphragmatic adhesions may limit the rise of the diaphragm, and the intra-abdominal pressure may cause a downward displacement of the abdominal viscera. But while in the advanced cases the presence of subdiaphragmatic adhesions, the extent of the lesions in the lung tissue and tonus of the diaphragm may nullify whatever benefits there are to be obtained from pneumoperitoneum, far better results are brought about when pneumo-

peritoneum is used in the early or moderately advanced case to enhance the value of phrenic neurectomy. Pneumoperitoneum is a far more formidable procedure than pneumothorax and therefore should be done with great caution and care. The author briefly describes the technic and then presents several case histories, in some of which pneumoperitoneum gave disappointing results. He summarizes the indications for pneumoperitoneum in pulmonary tuberculosis as follows: 1. It is indicated as a trial measure to determine diaphragmatic mobility and freedom from interfering subdiaphragmatic adhesions prior to phrenic interruption. 2. In cases in which a breakdown and reactivation of the tuberculous process have occurred after an effective phrenic operation, it may be possible by means of pneumoperitoneum to prevent reopening of the cavity. 3. Its greatest value lies in its ability to enhance the value of the diaphragmatic rise following phrenic interruption. 4. It is of value in preparing the patient for radical surgery and in making the lesion quiescent in less time than could be accomplished by bed rest alone. Pneumoperitoneum is of limited value as the sole therapeutic measure in pulmonary tuberculosis. Its benefits are not lasting.

Anesthesiology, New York

4:577-688 (Nov.) 1943

Effects of Drugs Used in Anesthesiology on Tone and Motility of Small Intestine: Experimental Study. R. F. Golden and F. C. Mann.—p. 577.

Chemical Absorption of Carbon Dioxide from Anesthetic Atmospheres. R. M. Waters.—p. 596.

New Resuscitation Apparatus. J. Kreiselman.—p. 608.

Circulatory Effects of Increased Pressure in Airway. H. K. Beecher, H. S. Bennett and D. L. Bassett.—p. 612.

Anesthesiology in Military Medicine. E. M. Papper and W. C. Sheehan.—p. 619.

Complication of Diabetes During Spinal Anesthesia. M. C. Peterson, R. Robertazzi and Joan Gochel.—p. 625.

Electronarcosis. P. S. Ross, assisted by R. O. Allen.—p. 630.

New Resuscitation Apparatus.—The apparatus described by Kreiselman consists of an expansible bellows type bag of about 1,600 cc. capacity, a face mask and a valve placed between them. There are valves for the intake of air and oxygen and a safety valve which limits pressure to 20 mm. of mercury. The apparatus operates to inflate the lungs with either air or oxygen at a safe, controllable predetermined pressure. Normal respiratory exchange with atmospheric air can take place while the apparatus is applied. When breathing begins the patient is always in free communication with either atmospheric air or the gases in the bag. Gases from the lungs cannot mix with the gases in the bag. The apparatus operates equally efficiently in any position. The apparatus when used in conjunction with the prone pressure method of artificial respiration greatly increases the effectiveness of that method. The apparatus meets the mechanical requirements for satisfactory and safe resuscitation, using a simple technic, and is small, light, compact, inexpensive and mechanically simple.

Archives of Internal Medicine, Chicago

72:565-708 (Nov.) 1943

Chronic Pulmonary Osteoarthropathy: Dyspituitarism as Probable Cause. B. M. Fried.—p. 565.

Preparation of Synthetic Immune Serum and Nature of Immunity. D. K. Bacon.—p. 581.

Therapy with Sulfonamide Compounds for Patients with Damage to Liver. O. L. Peterson, E. Deusch and M. Finland.—p. 594.

Rhythmic Property of Human Heart. M. H. Nathanson.—p. 613.

Diagnosis of Lipoid Pneumonia by Aspiration Biopsy. L. Nathanson, D. Frenkel and M. Jacobi.—p. 627.

Syphilis: Review of Recent Literature. F. W. Reynolds, C. F. Mohr and J. E. Moore.—p. 635.

Sulfonamides in Damage of Liver.—Peterson and his associates studied the effects of the administration of sulfonamide compounds on the clinical course and hepatic function of 37 patients with various disorders of the liver. All patients studied were admitted to Boston City Hospital. Only those are considered in whom there was clinical and laboratory evidence of damage to the liver and in whom tests of hepatic function were made before and after a course of some sulfonamide compound. Thirteen of the patients had acute hepatitis. In all except 1 of these patients, who had a catarrhal jaundice,

the damage to the liver, was secondary to an acute pyogenic infection. The remaining patients had chronic disease of the liver and included 14 with portal cirrhosis, 5 with biliary cirrhosis, 4 with damage to the liver resulting from chronic congestive cardiac failure and 1 with diffuse carcinomatosis. To most of the patients the sulfonamide compound was given in the usual therapeutic doses and for a definite pyogenic infection. To a few, however, the drug was given because of a suspected infection, the presence of which was not substantiated. Sulfathiazole and sulfadiazine were each used alone for 14 patients; both were given in succession or on separate occasions to 7, and 2 received sulfapyridine. The authors found that in the patients with acute hepatitis associated with bacterial infections the sulfonamide therapy was almost invariably associated with improvement in hepatic function which paralleled the improvement in the underlying infection. In the patients with chronic damage to the liver, hepatic dysfunction was not aggravated by administration of sulfathiazole or sulfadiazine. There was some improvement noted as a result of such therapy in cases in which bacterial infection was adding to the hepatic injury. Severe toxic effects of sulfonamide therapy other than direct injury to the liver were unusually frequent in the patients with portal cirrhosis and were twice as common after sulfathiazole as after sulfadiazine. The authors conclude that the presence of damage to the liver should not be considered a contraindication to therapy with sulfathiazole or sulfadiazine in patients with bacterial infections against which these drugs are effective. Sulfadiazine is the drug of choice in such cases. Caution should be exercised in the administration of sulfonamide compounds to patients with severe portal (Laënnec's) cirrhosis of the liver.

Bulletin of Johns Hopkins Hospital, Baltimore

73:239-306 (Oct.) 1943

Experimental Evidence that Lesions with Basic Characteristics of Rheumatic Carditis Can Result from Anaphylactic Hypersensitivity. A. R. Rich and J. E. Gregory.—p. 239.

Cerebral Malaria: Case Report. R. Whitehill.—p. 265.

Lymphocytic Choriomeningitis: Report of Laboratory Infection. G. S. Hayes and T. L. Hartman.—p. 275.

Effect of Amphetamine (Benzedrine) Sulfate on Higher Nervous Activity. E. B. Alpern, N. Finkelstein and W. H. Gantt.—p. 287.

Cancer Research, Baltimore

3:729-808 (Nov.) 1943

Chemotherapeutic Studies on Transmitted Mouse Leukemia. C. M. Flory, J. Furth, J. A. Saxton Jr. and L. Reiner.—p. 729.

Chemical Studies on Mode of Action of Methylcholanthrene on Mouse Epidermis. C. Carruthers and V. Sontzeff.—p. 744.

Further Studies on Tumor Promoting Action of Fat. P. S. Lavik and C. A. Baumann.—p. 749.

Spontaneous Testicular Tumors in Mice. W. U. Gardner.—p. 757.

Testicular Changes Resembling Early Stages in Development of Interstitial Cell Tumors in Mice of the A Strain after Long Continued Injections of Pregnant Mare Serum. C. A. Pfeiffer and C. W. Hooker.—p. 762.

Attempts to Abrogate Immunity to Brown-Pearce Carcinoma. O. Saphir and M. Appel.—p. 767.

Importance of Dosage in Intradermal Immunization Against Transplantable Neoplasms. L. Gross.—p. 770.

Polytene Chromosomes in Two Mammary Carcinomas of Human Subject. J. J. Riessle and H. Poyner.—p. 779.

Connecticut State Medical Journal, Hartford

7:737-810 (Nov.) 1943

Medical and Surgical Aspects of Hypertrophy and Cancer of Prostate. H. H. Young.—p. 739.

Some Comments on Contributions of Hugh H. Young to Urology. C. L. Deming.—p. 743.

Sulfonamide Compounds in Treatment of Ocular Infections: Review. P. Thygeson.—p. 746.

Psychosomatic Medicine. R. Goldstein.—p. 758.

War and Deafness. M. H. Lurie.—p. 763.

First American Observations on Poliomyelitis: Dr. Charles S. Caverly. C. Barker.—p. 766.

Delaware State Medical Journal, Wilmington

15:167-180 (Sept.) 1943

Inter-American Cooperation in Health Work. A. R. Dreisbach.—p. 167.

15:181-196 (Oct.) 1943

Responsibility and Future of Organized Medicine. L. J. Jones.—p. 181.
Value of Studies of Circulation. J. H. Foulger.—p. 182.

Journal of Allergy, St. Louis

14:507-582 (Nov.) 1943

- Vascular Allergy: III. J. Harkavy.—p. 507.
Studies on Hypersensitivity Due to Substances Employed in Fur Industry: I. Significance of Cutaneous Reactions to Fur Dye Dust Extracts. H. H. Shilkret and H. F. Swartz.—p. 538.
Allergic Manifestations in Atopic Individuals Following Injection of Tetanus Toxoid: Report of 2 Cases. H. Swartz.—p. 544.
*Anaphylaxis After Injection of Tetanus Toxoid. W. M. Edwards.—p. 552.
An Appraisal of Present Status of Prophylaxis Against Poison Ivy. F. A. Ellis.—p. 557.
Allergy in the Insane. M. Zeller and J. U. Edlin.—p. 564.

Anaphylaxis After Injection of Tetanus Toxoid.—After citing statistical figures on the incidence of severe reactions following immunizations with precipitated toxoid, Edwards reports the history of a man aged 29 who developed an anaphylactoid type of reaction after the administration of tetanus toxoid. The development of edema of the eyes and lips followed by collapse after a third injection of plain tetanus toxoid is obviously an anaphylactoid type of reaction. This is substantiated by skin tests and passive transfer studies to human skin. Allergy studies point to the veal infusion contained in the toxoid as the responsible factor. It is interesting that the patient gave no history of asthma or hay fever, and his skin tests with diagnostic allergens were all negative. This demonstrates that severe reactions do occur in the absence of a history of allergy. Cooke and his associates pointed out that all persons receiving tetanus toxoid should first be given skin tests. Gold discourages skin tests, but the apparent indifference of Gold to positive skin tests is certainly not shared by all. Edwards observed the sudden death of a young person who had not been given previous sensitivity tests twenty minutes after the injection of a second dose of plain tetanus toxoid combined with a third dose of typhoid vaccine. Autopsy revealed the presence of pulmonary edema. To minimize the significance of a positive skin test and then unhesitatingly administer the full dose parenterally is definitely contrary to the orthodox practice.

Journal of Industrial Hygiene & Toxicology, Baltimore

25:381-422 (Nov.) 1943

- Method for Determination of Trinitrotoluene (TNT) Derivatives in Human Urine. S. S. Pinto and W. L. Wilson.—p. 381.
*Experimental Trinitrotoluene Poisoning with Attempts at Detoxification. M. I. Smith, B. B. Westfall and E. F. Stohman.—p. 391.
Fluoride Ingestion and Bone Changes in Experimental Animals. E. J. Largent, W. Machle and I. F. Ferneau.—p. 396.
Effects of Repeated Exposure of Dogs to Monoalkyl Ethylene Glycol Ether Vapors. H. W. Werner, J. L. Mitchell, J. W. Miller and W. F. von Oettingen.—p. 409.
Determination of Approximate Lethal Dose with About Six Animals. W. B. Deichmann and T. J. LeBlanc.—p. 415.
Creosote Burns. A. D. Jonas.—p. 418.
Bronchial Asthma Due to Aluminum Dust: Case. L. H. Cotter.—p. 421.

Experimental Trinitrotoluene Poisoning.—Smith and his associates point out that one chemical change which uniformly has been found in experimental trinitrotoluene poisoning is the formation of a variable amount of diazotizable material in the tissues and body fluids, indicating the formation of reduced degradation products. It has been suggested that at least some of the reduced compounds may be detoxified by conjugation with glucuronic acid. If this is an essential mechanism of detoxification, ascorbic acid might play an important part, since it has been shown that it can detoxify phenol in a manner analogous to glucuronic acid. Experiments were undertaken to ascertain the effects of ascorbic acid in chronic trinitrotoluene poisoning in several animal species; animals highly susceptible to trinitrotoluene, as the cat, and animals with a high natural resistance to it. In the latter group rats were used, which do not require exogenous ascorbic acid, guinea pigs, in which exogenous ascorbic acid is indispensable, and rabbits, which are intermediate in this respect. It was found that the administration of ascorbic acid had little effect on the course of chronic trinitrotoluene poisoning in rats, guinea pigs or rabbits. In cats, which are relatively highly susceptible to trinitrotoluene poisoning, ascorbic acid appeared to have a slightly favorable influence on the course of intoxication. The distribution and elimination of reduced degradation products of trinitrotoluene

were not materially influenced by the ascorbic acid treatment. The glucuronic acid output in the urine was not influenced by trinitrotoluene, and the somewhat augmented output in porphyrins noted in some animals was not affected by ascorbic acid treatment.

Journal-Lancet, Minneapolis

63:307-336 (Oct.) 1943

- Studies on Conditioned Reactions and Their Clinical Implications. E. Gellhorn.—p. 307.
Wagner-Murray-Dingle Social Security Plan S. 1161 H. R. 2861: Analysis of Bill. J. C. Shields.—p. 313.
Remarks on Senate Bill 1161. J. P. Ritchey.—p. 315.
Medical Aspects of Civilian Defense. F. T. Foard.—p. 316.
Emergency Maternity and Infant Care Program, Administered by State Health Departments. Edith P. Sappington.—p. 320.

Journal of Nervous and Mental Disease, New York

98:457-570 (Nov.) 1943

- Dissolution of Ego, Mannerism and Delusion of Grandeur. R. C. Bak.—p. 457.
Prognosis in Schizophrenia: Analysis of Prognostic Criteria in 150 Schizophrenics Treated with Metrazol or Insulin. L. S. Chase and S. Silverman.—p. 464.
Differential Diagnosis of Physiologic and Pathologic Sleep. L. Hess.—p. 474.
Emotional Facial Expressions of Cats in Bulbocapnine Catatonia. H. de Jong and Ethel Chase.—p. 478.
*Oxygen in Electroshock Therapy. Anne Holovachka.—p. 485.
Guillain-Barré Syndrome: Report of Case. R. F. Gayle Jr. and D. Groom.—p. 488.
Mediate Psychotherapy and Acute Homosexual Panic (Kempf's Disease). B. Karpman.—p. 493.
Dysphormism in Psychoses and Its Correction by Shock. L. J. Meduna.—p. 507.
Endocrine Maldevelopment in Schizophrenia. L. Kerschbaumer.—p. 521.

Oxygen in Electroshock Therapy.—Holovachka reviews observations on 178 electroshock treatments without and on 125 with oxygen. A mask of nasal type was held over the nose the instant the current was sent into the electrodes. The oxygen was maintained at 8 liters per minute until cyanosis completely disappeared, a time which seldom exceeded four minutes. The total amount of oxygen consumed averaged 40 liters and was supplied from a large industrial cylinder. The question of increased effectiveness of the treatment with oxygen cannot be answered, because the number of cases are not adequate. However, the tolerance for treatments was increased so that the hazard to patients with cardiac dysfunction was diminished. One hundred and seventy-eight treatments without oxygen resulted in 54 complaints of headaches, 5 instances of remarkably persistent cyanosis, 75 confusional states, which were observed as late as six hours following a morning treatment, and 14 episodes of nausea and vomiting. These were contrasted with 125 treatments in which oxygen had been administered, resulting in 15 complaints of headache, no pronounced cyanosis, 1 confusional state and 1 case of nausea and vomiting.

Journal of Neurophysiology, Springfield, Ill.

6:329-458 (Sept.-Nov.) 1943

- Acetylcholine Level of Rat Cerebral Cortex Under Conditions of Anoxia and Hypoglycemia. J. H. Welsh.—p. 329.
Accommodation and Autorhythmic Mechanism in Single Sensory Fibers. R. Granit and C. R. Skoglund.—p. 337.
Relation of Area 13 on Orbital Surface of Frontal Lobes to Hyperactivity and Hyperphagia in Monkeys. T. C. Ruch and H. A. Shenkin.—p. 349.
Responses to Electrical Stimulation of Single Sensory Units of Skin. G. H. Bishop.—p. 361.
Action Potential and Enzyme Activity in Electric Organ of *Electrophorus Electricus*: II. Phosphocreatine as Energy Source of Action Potential. D. Nachmansohn, R. T. Cox, C. W. Coates and A. L. Machado.—p. 383.
Formation of Acetylcholine—New Enzyme: "Choline Acetylase." D. Nachmansohn and A. L. Machado.—p. 397.
Effects on EEG of Chronic Lesions of Basal Ganglia, Thalamus and Hypothalamus of Monkeys. Margaret A. Kennard.—p. 405.
Hand and Foot Patterns of Low Electrical Skin Resistance: Their Anatomic and Neurologic Significance. C. P. Richter, Betty G. Woodruff and Billie C. Eaton.—p. 417.
Nature of Paresis Following Lateral Corticospinal Section in Monkeys. R. W. Cannon, L. E. Beaton and S. W. Ranson Jr.—p. 425.
Removal of Acetylcholine by Cholinesterase Injections and Effect Thereon Nerve Impulse Transmission. B. Mendel and Rosmary D. Hawkins.—p. 431.
Basis for Repetitive Activity in Phrenic Motoneurons. R. F. Peck.—p. 439.

Kentucky Medical Journal, Bowling Green

41:365-396 (Nov.) 1943

- Medical Problems in Kentucky. C. B. Stacy.—p. 368.
Where To, Surgery? B. W. Smock.—p. 373.
Rocky Mountain Spotted Fever: Case Report. F. M. Stites.—p. 376.
Rocky Mountain Spotted Fever in Kentucky. F. W. Caudill.—p. 376.
Few Observations in Gallbladder Surgery. E. W. Northcutt.—p. 383.
Pathology of Cells. J. E. Pinguely.—p. 384.
Studying the Patient as a Whole. A. F. Cornelius.—p. 386.
Transurethral Prostatic Surgery. W. R. Miner.—p. 388.
Linseed Oil. C. W. Reynolds.—p. 390.

Mental Hygiene, Albany, N. Y.

27:531-714 (Oct.) 1943. Partial Index

- The Adolescent in a World at War. J. Slawson.—p. 531.
Chronophobia: Prison Neurosis. S. Russo.—p. 581.
Adviser System—Prophylactic Psychiatry on Mass Scale. S. H. Kraines.—p. 592.
Unique Structure and Function of the Mental Hygiene Unit in the Army. H. L. Freeman.—p. 608.

Minnesota Medicine, St. Paul

26:937-1022 (Nov.) 1943

- *White Bile. A. Schwyzer.—p. 955.
*Abnormal Uterine Bleeding in Adolescence. Nora Winther.—p. 961.
Hemorrhage in Pregnancy. F. J. Schatz.—p. 968.
Hemorrhage in Menopause. L. M. Randall.—p. 976.
*Experiments with Rh Substance in Transfusion Reactions. R. W. Koucky.—p. 980.

White Bile.—According to Schwyzer, "white bile" is a misnomer. It is often not white but a colorless liquid like water, and it is not bile. However, it is in the place where normally bile is found. Hydrops of the gallbladder is not considered in this report. The author's experience with white bile is limited to 9 cases. In 2 of them normal bile appeared on the evening of the day of operation, in another after twenty-four hours and in the fourth one after thirty-six hours. They recovered. A fifth one died of cholemia after barely four days without return of normal bile, not even the slightest coloring. The other 4 cases are described in detail. In 1 case a chemical analysis of the white bile was made. It was found to contain neither bile acids nor bile pigment nor digestive ferments. What looked like white bile in another case was due to reflux of pancreatic secretion through a catheter in the common bile duct. The author stresses that the white bile as seen by the pathologist in sepsis rests on a fundamentally different cause from that seen by the surgeon in cases of obstruction of the bile ducts. Infection is not the basic cause in the surgical white bile. The underlying condition is obstruction to the bile flow, though frequently infection also is present. White or, rather, colorless bile is a secretion of the ducts with their glands. A water colored secretion from bile choked liver acini is not really thinkable. On the other hand, a poorly colored or even uncolored bile in overwhelming sepsis without noticeable obstruction is the result of greatly disintegrated liver, though even here some obstructive swelling may cooperate. Dextro-galactose tests indicate that, in cases of even severe icterus experimentally provoked by ligation of the common duct, the liver function is not (at least for a long time) destroyed in this respect. Normally colored bile may start flowing immediately after decompression followed by recovery or may not appear until death. If normal bile does not appear thirty-six or forty-eight hours after releasing of the obstruction the prognosis becomes grave, though even after four days' delay recovery was observed.

Abnormal Uterine Bleeding in Adolescence.—Winther found that, of 7,634 women entering the University of Minnesota from 1938 to 1942, 22 per cent complained of irregular menstruation. During these four years 2,302 students have consulted the gynecologic department of the Student Health Service, 630 of whom came because of irregular bleeding. Treatment must be preceded by a careful examination to determine the cause of the abnormal bleeding. In the adolescent, abnormal bleeding is frequently self limited and is best left untreated. Endocrine therapy should be used cautiously. Desiccated thyroid is indicated when the serum cholesterol concentration is increased or the basal metabolic rate is decreased. Excellent results have been obtained in profuse menstrual bleeding with small doses of thyroid. An endometrial biopsy or hormone

assays should precede the use of estrogens. They should not be given to the adolescent in large doses over a long period of time because they do not stimulate the growth of the ovaries but actually inhibit the pituitary and thus reduce the ovarian function. Progesterone also has been used in the treatment of abnormal uterine bleeding. Chorionic gonadotropin has given good results in profuse uterine bleeding in the adolescent. The dosage is difficult to calculate. Sixty-four patients with profuse menstrual bleeding were treated at the University Health Service from 1938 to 1942. Forty-six were given chorionic gonadotropin. Thirty-eight responded favorably. Equine gonadotropin (gonadogen) was given to 17 with improvement in 40 per cent of the cases. It is better not to give testosterone unless one understands its limitations and dangers. Combined treatment with estrogens and progesterone have been used successfully in amenorrhea and profuse bleeding. The immediate control of severe bleeding is the real problem. Rest in bed and oxytocics may control the hemorrhage. Posterior pituitary injection or ergonovine may be used as a temporary control. A curettage should be performed if the bleeding continues. Blood transfusions should be given in cases of severe anemia. Good results have been reported from using pregnant donors or lactating women. In the 2 cases in which moccasin snake venom was used by the author it did not affect the bleeding. Vitamin K may be given. General health measures are important in preventing recurrences of abnormal bleeding. Low dosage irradiation of the pituitary or ovary in the adolescent must be used with great caution.

Rh Substance in Transfusion Reactions.—Koucky presents the nature of the reactions due to Rh sensitization and discusses the Rh substance, the Rh antibody and other aspects of this problem, citing 16 illustrating case reports. He stresses that the Rh substance is similar to the A and B substances which determine the division into the four blood groups. Rh positive individuals cannot become sensitized. Rh negative individuals, if inoculated by transfusion—or during pregnancy from the fetus—may develop antibodies. The Rh substance varies in its antigenic property: some persons become sensitized very readily, while others do not. The antibody which can be demonstrated in the laboratory is the agglutinin. Apparently other types of antibodies are formed which are not detected by laboratory tests but will produce transfusion reactions or erythroblastosis in the fetus. The absence of demonstrable agglutinins, therefore, does not exclude the presence of dangerous antibodies. In pregnancy the antibodies may develop between the eighth and twelfth weeks, so that transfusions after early abortions must be handled as those later in pregnancy. An investigation of the obstetric history of women should be made prior to a transfusion and, if evidence of erythroblastosis in the babies is present, the possibility of sensitization should not be overlooked. Except under rare circumstances whole blood should never be given to pregnant or puerperal women until their Rh grouping is known. If multiple transfusions are to be given, a knowledge of the Rh grouping is very helpful. If Rh positive, the transfusion program can be carried out with no worry relative to Rh sensitization. If the patient happens to be Rh negative, an attempt may be made to complete the transfusion program within the five or six day period before antibodies can develop. After reactions develop, the transfusion program can be continued but only by using Rh negative donors. In transfusing erythroblastotic babies, the mother's blood should not be used.

Northwest Medicine, Seattle

42:275-306 (Oct.) 1943

- Malaria. E. C. Faust.—p. 278.
Wartime Malaria in Oregon: Report of Case. B. Jeffries.—p. 285.
Treatment of Acute Arthritis. K. K. Sherwood and B. Zimmerman.—p. 288.
Early Postoperative Walking Following Abdominal Surgery. J. A. Rickles.—p. 292.

42:307-344 (Nov.) 1943

- Obstructive Lesions of Colon: Diagnosis and Surgical Management. W. H. Buermann.—p. 311.
Yellow Fever, Dengue and Sandfly Fever. E. C. Faust.—p. 315.
Vaginismus and Dyspareunia: Causes, Management and Treatment. C. Small.—p. 322.
Acute Thrombocytopenic Purpura. J. H. Lehmann.—p. 325.

Public Health Reports, Washington, D. C.

58:1641-1668 (Nov. 5) 1943

Surveys of Milk Laboratories in War Areas in United States: II. Practices Observed in Making Direct Microscopic Examinations and Methylene Blue Reduction Tests. L. A. Black—p. 1641.

58:1669-1700 (Nov. 12) 1943

Diet in Germany and the Occupied Countries During the Second World War. C. G. Spicknall, H. D. Fishburn and W. S. Baum—p. 1669
Surveys of Milk Laboratories in War Areas in United States: III. Observations on Sampling and Health Department Practice Relative to Bacteriologic Milk Analysis. L. A. Black—p. 1681

Rhode Island Medical Journal, Providence

26:187-230 (Oct.) 1943

Burns. C. C. Lund—p. 197.

Acute Intestinal Poliomyelitis (the 1943 Epidemic). K. K. Gregory.—p. 201.

26:231-274 (Nov.) 1943

Rh Factor—Its Role in Erythroblastosis Fetalis, and Intra Group Transfusion Reactions. E. S. Brackett and B. E. Clarke—p. 241.

Texas State Journal of Medicine, Fort Worth

39:365-414 (Nov.) 1943

*Use of Succinylsulfathiazole and Phthalylsulfathiazole as Intestinal Antiseptics. E. J. Poth—p. 369.

Diagnosis of Amebiasis by Laboratory Methods. W. N. Powell—p. 372.
Dissecting Aneurysm of Aorta. M. A. Zions—p. 375

Surgical Treatment of Gastrojejunal Ulcer. G. R. Enloe—p. 381.

Surgical Treatment of Ruptured Appendix. A. L. Ridings—p. 384

Intravenous Anesthesia. J. D. Nichols—p. 387.

Nausea and Vomiting of Pregnancy. E. N. Smith—p. 389

Succinylsulfathiazole and Phthalylsulfathiazole as Intestinal Antiseptics.—According to Poth, sulfanilylguanidine, which has been used successfully in the treatment of bacillary dysentery, has little antibacterial activity when there are ulcerations in the bowel. This may explain the ineffectiveness of sulfanilylguanidine late in the disease. Succinylsulfathiazole alters the bacterial flora and reduces the bulk of the fecal material while rendering it semifluid. For this reason it can be used in the preoperative treatment of the gastrointestinal tract. Succinylsulfathiazole 0.25 Gm. per kilogram of body weight, divided into six equal portions, is administered at four hour intervals by mouth. Postoperatively no gastric suction is used, and as soon as the patients can take 30 cc. of warm water, and this usually occurs within twenty-four hours after operation, the administration of the drug, similar to the preoperative regimen, is reinstituted. The drug is tolerated surprisingly well. Its administration is continued for from twelve to fourteen days postoperatively. In a series of some 50 patients in whom primary sutures of the large bowel was undertaken there has been no instance of peritonitis or fecal fistula. The studies on acylated sulfonamides as intestinal antiseptics have been extended to new compounds, including phthalylsulfathiazole (sulfathalidine). This compound showed from two to four times the bacteriostatic activity of succinylsulfathiazole locally in the gastrointestinal tract, as indicated by the alteration of the coliform flora. Phthalylsulfathiazole, like succinylsulfathiazole, is sparingly absorbed from the gastrointestinal tract and should be more effective in treating bacillary dysentery than is succinylsulfathiazole or any other of the known sulfonamides.

Virginia Medical Monthly, Richmond

70:543 (Nov.) 1943

Our Responsibilities to Organized Medicine. J. M. Emmett—p. 545.

Three Successful Cases of Total Gastrectomy. J. S. Horsley—p. 549

Some Facts and Fallacies in Diagnosis and Treatment of Certain Phases of Pulmonary Tuberculosis. S. E. Hughes—p. 554

Plans for Mission Hospital Center in Korea. R. M. Wilson—p. 558

Sulfaguanidine in Treatment of Acute Bacillary Dysentery. Study of 520 Cases. S. G. Page—p. 561.

Note on Treatment of Pulmonary Tuberculosis by Administration of Hydrochloric Acid. F. L. Apperly—p. 570

Recent Activities Regarding Compulsory Health Insurance. F. I. Libby.—p. 572.

Triplets: Case Report. B. C. Grigsby—p. 578.

Nature and Management of Cough. P. P. Vinson—p. 579

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Journal of Royal Army Medical Corps, London

81:101-154 (Sept.) 1943

Intracranial Aerocele with Extension to Lateral Cerebral Ventricle. Case. J. A. C. Fleming, with clinical and pathologic notes by I. G. W. Hill and R. Walmsley.—p. 101.

Desert Sore: Preliminary Study. F. R. Bettley.—p. 107.

Mobile Blackwater Fever Treatment Teams. G. M. Findlay.—p. 113.

Arsenical Toxaemia. Selection of Cases. H. J. Bell and A. E. Wilkin—p. 119.

Medical Officer of a P. O. W. Camp. R. S. Vine—p. 128

Lancet, London

2:465-496 (Oct. 16) 1943

*Thyrotoxicosis Treated with Thiourea. H. P. Himsworth.—p. 465.

*Sternal Puncture in Diagnosis of Malaria. G. J. Aitken—p. 466

Sternal Puncture in Diagnosis of Malaria. C. A. Rumball, B. G. Parsons Smith and L. Nancekivell—p. 468.

Gastrointestinal Hemorrhage Treated Medically with Enthusiastic Blood Transfusion. M. H. Pappworth and J. F. Loutit—p. 469.

Intracranial Injection of Potassium Phosphate. C. B. B. Downman and C. C. Mackenzie—p. 471.

"Stress" Fracture of Femoral Neck. L. Henry.—p. 473.

Untoward Effects of Vitamin B₁₂. Z. A. Leichter.—p. 474

Paroxysmal Hyperinsulinism Due to Islet Adenoma of Pancreas. M. S.-M. Rayner and C. H. Rogerson, with Note on Surgical Aspect by J. G. Jones.—p. 476.

Prostatic Enlargement Treated by Braasch Bumpus Puncture. W. A. Sewell and R. Maier.—p. 479

Hippuric Acid Excretion and Urine Volume. A. Palmer.—p. 481.

Thiourea in Treatment of Thyrotoxicosis.—Himsworth confirms Astwood's claims for the initial effects of thiourea in cases of thyrotoxicosis. Six cases have been treated. The author gives a detailed description of 1 severe case. The results in the other, milder cases were similar but less dramatic. In 1 case thyroidectomy was done because the goiter was compressing the trachea. In this case thiourea alone was given and proved a satisfactory preoperative preparation. The tissue removed at operation was hyperplastic and practically free from colloid. Two disadvantages have been found, and these have proved trivial. Thiourea has a nauseating taste, and at the beginning of therapy considerable nausea or even vomiting may occur. The second disadvantage is the peculiar sweet smell which it imparts to the breath. Discussing the mode of action of thiourea, the author says that the evidence at present available indicates that thiourea acts by interfering with the synthesis of the thyroid hormone.

Sternal Puncture in Diagnosis of Malaria.—According to Aitken, examination of the sternal bone marrow may help in diagnosis of malaria. He reviews a series of 105 cases to draw attention to the value and limitations of this method. To compare the aspects of marrow with those of the blood, sternal puncture was performed on 10 patients with parasites in the peripheral blood. The marrow fluid in each case contained a substantially higher proportion of cells containing parasites. In the other 95 cases sternal puncture was performed only when serial thick drops taken at six hourly intervals had proved negative. The author concludes that examination of sternal marrow fluid should be carried out in cases in which repeated examination of the peripheral blood is negative. It elucidates the diagnosis in a number of cases of obscure illness.

2:497-528 (Oct. 23) 1943

Spontaneous Subarachnoid Hemorrhage: Review of 150 Cases. C. G. Magee—p. 497.

*Deposition of Protein Material in Implanted Pellets of Steroid Hormones. R. Deaneley and A. S. Parkes—p. 509.

Transfusion in the Ambulance: Its Value in the Western Desert. H. K. Lucas—p. 503

Fürch's Megaloblasts: Associated with Low Mean Corpuscular Volume and Red Cell Diameter. H. Fox and A. Kendal—p. 505

Posterior Substernal Arthrodesis in Fractured Os Calcis. J. P. Armstrong—p. 506

Conchal Cyst of Larynx. Jane I. Davidson—p. 508

Oxford Vaporiser for Endotracheal Anesthesia. M. A. Richardson—p. 512

Deposition of Protein in Implanted Steroid Hormones.—According to Deaneley and Parkes, crystalline steroid hormones are now often administered by the subcutaneous implantation of pellets made by compression. If a pellet is left

undisturbed in the subcutaneous tissue for some time it becomes in most cases enclosed in a tight connective tissue capsule. The extent to which the capsule prevents continued absorption is not yet clear; on the one hand there is good evidence that tablets may be absorbed at a regular rate throughout their life; on the other hand there are reports that capsule formation may bring to an end the absorption of active material while much of the pellet still remains. A fresh aspect of this problem was raised by Folley, who found that tablets of diethylstilbestrol which had been implanted for an appreciable time acquired, in addition to the connective tissue capsule, an interstitial deposit of protein matter. Folley holds that the interstitial deposit progressively inhibits absorption. Compressed tablets will inevitably have interstices that can be filled with protein, and considerable interest therefore attaches to a recently introduced method of making pellets for implantation by fusing the active substance into solid blocks. The authors have examined the behavior of fused blocks by comparison with that of compressed tablets. In experiments with estradiol, progesterone, testosterone and desoxycorticosterone acetate it was found that tablets made by compression were absorbed, after subcutaneous implantation, at about the same rate as blocks made by fusion. Both types of pellet acquired an interstitial deposit of protein material as described for diethylstilbestrol tablets by Folley, but microscopic examination showed that, whereas the deposit was continuous throughout the tablet, it was superficial only in the block. The formation of the protein deposit is not dependent on the presence of the capsule, as it appears within a few days of implantation, before encapsulation takes place. No evidence was obtained that the interstitial deposit of protein material slows up the absorption of the pellets.

2:529-560 (Oct. 30) 1943

- Physician in War in Harvey's Time and After. W. E. Hume.—p. 529.
 Localized Neuritis of Shoulder Girdle: Report of 16 Cases. J. D. Spillane.—p. 532.
 Observations on Typhus Epidemic. C. F. McConn. p. 535.
 Rickettsial Agglutination Studies in Typhus. G. H. Stuart-Harris, G. K. C. Rettie and J. O. Oliver.—p. 537.
 Costoclavicular Compression of Subclavian Artery and Vein: Relation to Scalenus Anticus Syndrome. M. A. Falconer and G. Weddell.—p. 539.
 Chronic Flexner Dysentery Treated with Succinylsulfathiazole. W. A. Caldwell and S. W. Hardwick. p. 544.

Localized Neuritis of the Shoulder Girdle.—According to Spillane, cases with unusual neuritic features have come to be recognized in the armed forces which were not observed before the war in such numbers. The author himself has seen 20 such cases, and he has studied the records of others. A fairly clear clinical picture emerged of what might be called localized neuritis of the shoulder girdle. In 42 of these 46 cases the onset of the illness was characterized by sharp pain about the shoulder. The painful sites were usually along the upper border of the trapezius, over the spinati and the belly of the deltoid. Pain was sometimes felt along the inner border of the scapula, in the axilla or up the side of the neck. Many patients said it was severe and burning, and nearly all of them needed analgesics. The pain was commonly worse at night and disturbed or prevented sleep. It was aggravated by lying on the affected side and persisted acutely for from three to fourteen days; thereafter it rapidly subsided, but in a few cases a chronic ache was complained of for six or seven weeks. The pressure of braces or the weight of a gun or pack aggravated the discomfort. Pain was more severe in those muscles which subsequently showed atrophy. The muscles affected were the serratus magnus, spinati, deltoid, trapezius, sternomastoid and rhomboids. Effective movements of the shoulder girdle were greatly hampered. The wasted deltoid with paralysis of abduction, the hollowed supraspinous and infraspinous fossae of the scapula and the winging of the scapula, alone or in various combinations, produced a striking deformity of the shoulder girdle. The usual forms of treatment for neuritis did not seem to alter the course of the illness. If these patients are seen for the first time some months after the acute phase, the malady might be mistaken for poliomyelitis. The author differentiates the condition from poliomyelitis and also from acute brachial

radiculitis or neuritis. He considers the possible role of injection neuritis and of repeated minor traumas. The preponderance of rightsided cases and the selective nature of the muscle wasting suggests that "injection neuritis" is not an important factor. It is quite possible that the long thoracic and suprascapular nerves could be injured by carrying a weight (pack and rifle) across the shoulder. Many of these patients, however, were employed in sedentary posts, and 26 of them developed the illness while convalescing in hospital.

Rickettsial Agglutination Studies in Typhus.—Stuart-Harris and his associates made investigations on the serums of patients convalescent from typhus contracted in the Spiddal area of Galway in 1942. Convalescent serums which were collected at intervals of from two to five months after the subsidence of fever were examined for agglutinins to the OX proteus organisms and to murine and epidemic rickettsias. The murine strain was the Wilmington (US) strain, and two epidemic strains were employed, namely the classic Breinl strain first isolated fifteen years ago and a strain recovered from a case of louse borne typhus in Cairo in 1942. Significantly elevated OX 19 titers in excess of 50 were present in 5 of the 9 cases and high OX 2 titers in 2 of these and in 1 other. No case exhibited a high OXK titer. Rickettsial agglutinins were present in 7 serums when examined with the Cairo strain, and 2 of these showed no reaction with Breinl or murine strains. Five of the serums reacted with all three rickettsial strains, and four of these showed a higher titer with the epidemic than with the murine organism, the remaining serum having similar titers with all three strains. The intensity or completeness of agglutination in these 5 serums was also less with the murine than with the epidemic strains, and in 2 instances only traces of agglutination were obtained with the murine organism, whereas both epidemic strains gave 2 plus agglutination. The authors also review observations on the serums of inoculated persons and on animals. They show that until recently the only laboratory method available for the differentiation of human typhus into epidemic and murine types was the classification by guinea pig reaction of the strains of rickettsias recovered from the patients into nonorchitic and orchitic categories. Plotz in 1943 showed by means of the complement fixation reaction that rickettsial antigens could be used to demonstrate specific differences between the two species of rickettsias and that the results with human serums indicated that Brill's disease was serologically related to epidemic rather than to murine typhus. The results of agglutination tests on serums from experimentally infected animals and of absorption tests on these serums indicate that rickettsial agglutination is another possible method of demonstrating specific differences between *Rickettsia prowazeki* and *Rickettsia mooseri*. The application of these findings to human cases of typhus suggests that rickettsial agglutination can be employed to differentiate epidemic and murine typhus and thus to throw light on the epidemiology of the disease. The data indicate that the cases of typhus in Galway were due to *Rickettsia prowazeki*, and this agrees with the observation of McConn that the disease was louse borne.

Chronic Flexner Dysentery Treated with Succinylsulfathiazole.—Caldwell and Hardwick report the history of a woman aged 36 who had chronic schizophrenia. She had had diarrhea and stools positive for Flexner dysentery intermittently for nearly eighteen months before succinylsulfathiazole therapy was instituted. Sulfaguanidine had been tried on four separate occasions without success. Yet after a single course of succinylsulfathiazole her symptoms cleared and the stools became negative for the dysentery bacillus.

Tubercle, London

24:113-130 (July) 1943

- Wartime Increase in Tuberculous Meningitis in Relation to Infection from Milk. E. M. Williams and R. L. Milne.—p. 113.
 Spontaneous Hemothorax: Report of Case. J. Almeyda.—p. 117.
 Phrenic Paralysis: Its Place and Value in Treatment of Tuberculosis. F. L. Wollaston.—p. 121.

Der deutsche Militärarzt, Berlin**7:353-416 (June) 1942. Partial Index**

- Psychiatric Aids in Selection of Officer Candidates, with Special Consideration of Characterologic and Heredobiologic Aspects. E. Illing.—p. 353.
- Relation Between C Hypovitaminosis and Inflammatory Processes of Gums. F. Faber.—p. 372.
- Desirability of Using Lead 4 (Chest Lead) During Electrocardiography in Military Hospitals. Dietzel.—p. 377.
- Experiences with Preserved Serum and Plasma in War. K. Lang and H. Schwiegl.—p. 379.
- Rapid Opening of Skull Under War Conditions. K. W. Kondeyne.—p. 384.
- Practical Temporary Prosthesis After Leg Amputation. C. Pfeiffer.—p. 386.
- Foot Deformities in Relation to Fitness for Infantry Service. H. Grebe.—p. 392.
- Syphilis of Tonsils in Military Medicine. T. Hünemann.—p. 394.

Preserved Serum and Plasma in War.—Lang and Schwiegl studied the use of preserved blood under war conditions. Their own experiences cover 92 cases, and in addition they review 258 cases observed by others. The effect of the infusion of preserved blood is the same as that of fresh blood. It is most effective in severe loss of blood and in shock. Not only did it counteract the circulatory collapse in dysentery, but in some cases it also reduced or counteracted the diarrhea. The effect is the same whether serum or plasma is used. The best form of preservation is the dry form. The dry preparations produced by the authors dissolve within a few minutes. To dissolve the dry powder they use the locally available water after boiling and filtration.

Münchener medizinische Wochenschrift, Munich**89:507-528 (June 5) 1942. Partial Index**

- Differential Diagnosis of Early Typhus. Jacobi and Dörschel.—p. 507.
- New Investigations on Tularemia in Turkey. E. Gotschlich.—p. 509.
- Lichen Urticatus Caused by Vermin. F. Hamburger.—p. 514.
- Practical Value of Bacteriologic Examination of Cadaver Blood and Organs. H. Eck.—p. 515.
- Significance of Female Genital Hypoplasia for Sterility. F. H. Bardenheuer.—p. 518.
- Diagnosis of Osteosclerotic Anemia. L. Binder, O. Riedl.—p. 519.
- Treatment of Sycois Simplex. R. Wernsdörfer.—p. 521.

Differential Diagnosis of Early Typhus.—Jacobi and Dörschel state that the early diagnosis of typhus is of great importance in the prevention of the dissemination, because if the patient is thoroughly deloused during the first five days dissemination can be completely prevented. The blood sucking louse can obtain the infectious organism from the patient only after an incubation period of from five to seven days. The author observed the development of 108 cases of typhus during the early stages. A positive outcome of the Weil-Felix reaction can be expected from the fifth day on and occasionally from the third day. It definitely indicates typhus from 1:200 and upward. The dry blood agglutination according to Kudicke and Steuer is also valuable. It has the advantage of rapidity of execution. The following symptomatology is always suggestive of typhus: acute onset with fever between 39 and 40 C. within one or two days, severe headaches, ocular pains, redness of the conjunctivas, influenzal throat symptoms, general malaise and extreme weakness. The pulse is usually soft but not frequent. Relative bradycardia together with hypotension is observed in about 75 per cent of the cases. The bradycardia persisted even in the presence of high fever. An exanthem on the soft palate preceded the typhus exanthem in about 70 per cent of the cases. At the same time the entire pharynx is red as in influenza, for which typhus has been mistaken at this stage. Conjunctival injection is seen early in 75 per cent of cases. About 25 per cent of the patients showed signs of meningism. If rigidity of the neck and positive Kernig's sign are present in a patient in whom other symptoms indicate typhus, spinal puncture should be done because epidemic meningitis might exhibit the same initial symptoms as typhus or it may complicate typhus. Bronchitis was present in 80 per cent of the cases. Percussion revealed enlargement of the spleen in all cases. The exanthem appeared between the third and seventh day and it was frequently preceded by marbling of the skin. The spots are pale bluish, in contradistinction to the elevated roseola of typhoid, they are in the skin, not raised above it.

In the later course the exanthem becomes darker, and in the presence of anemia and in dark skinned persons it may not be seen. The differential diagnosis of incipient typhus must consider influenza, pneumonia, abdominal typhoid, measles, epidemic encephalitis, toxemia following freezing, trichinosis, epidemic meningitis, five day fever and allergies.

Diagnosis of Osteosclerotic Anemia.—Binder and Riedl point out that Albers-Schönberg disease or marble bones appears early in life, but this is only the infantile form of osteosclerosis. There is also a form that occurs in adults; but whereas in the infantile form the skeletal changes predominate, in adults the hematologic signs are prominent and the bone changes may remain unnoticed. Wolf has differentiated the following forms of osteosclerosis: (1) osteosclerosis with myeloid leukemia, (2) osteosclerosis with myeloid and lymphoid aleukemia, (3) osteosclerotic anemia, (4) osteosclerosis with panmyelophthisis and fatty degeneration of marrow, (5) osteosclerosis of the newborn and (6) Albers-Schönberg's disease. The authors describe the clinical history of 2 patients in whom the diagnosis was made on the basis of the hematologic aspects and of experiences in the course of sternal puncture, which proved impossible because of extreme hardness of the sternum. One of these patients died; the second one improved after blood transfusion and after that was not heard from again. The authors think that these 2 cases were the first ones in which the diagnosis osteosclerotic anemia was made during life. They describe the roentgenologic aspects of the bones and blood pictures of both patients as well as the postmortem observations on one. The bone tissue showed great density, and there were only remnants of mostly fatty marrow. The authors stress that osteosclerosis has neither a typical blood picture nor uniform hepatic and splenic aspects. Extreme hardness of the sternum is an important diagnostic factor in that it directs further investigations into the correct channels.

Zentralblatt für Chirurgie, Leipzig**69:817-848 (May 16) 1942. Partial Index**

- Surgical Therapy of Central Cervical Fistula. B. Breitner and E. Ruckenstein.—p. 821.
- X-Ray Shadow of Large Solitary Calcification in Spleen. D. von Keiser.—p. 827.
- Prevention of Circulatory Collapse in Lumbar and Spinal Anesthesia. H. W. Pässler.—p. 834.
- Blood Coagulation and Thromboembolism. W. König.—p. 838.

Prevention of Circulatory Collapse in Spinal Anesthesia.—Pässler states that pholedrine (paredrinol or veritol) counteracts the harmful effects of vascular paralysis and thus prevents circulatory collapse. He studied the efficacy of pholedrine particularly in persons of advanced age, in a large number of lumbar anesthetics and in upper spinal anesthetics, the effects of which usually reach to the level of the nipples. Fall in blood pressure could be counteracted in from two to five minutes by an intramuscular injection of from 1 to 1.5 cc. of pholedrine. The systolic pressure, particularly, usually rose considerably higher than the pressure which existed before the anesthesia. The author feels that the object should be not to counteract the circulatory collapse but to prevent it. To accomplish this he gives prophylactically an intramuscular injection of pholedrine immediately after the injection of the anesthetic.

Blood Coagulation and Thromboembolism.—König believes that the synephrin treatment which he recommended in 1933 is still the most widely used measure in the prevention of thrombosis. The success reported by Lenggenhager with heparin (3,800 operations without embolism) induced him to try it. He administered heparin intravenously, usually in four doses, immediately after the operation and eight, twenty-four and thirty-two hours later. In all, 120 adult patients were treated in this manner. The following complications occurred: 2 pulmonary embolisms, 1 pulmonary infarct and 9 severe post-operative hemorrhages and hematomas. The large number of wound complications has discouraged him from further use of heparin. He feels that it is dangerous to interfere with the process of coagulation after operation. In addition to synephrin he employs carbon dioxide inhalation, massage of the legs, exercises and raising of the foot end of the bed.

Book Notices

Manual of Industrial Hygiene and Medical Service in War Industries. William M. Gafar, D.Sc., editor. Issued under the Auspices of the Committee on Industrial Medicine of the Division of Medical Sciences of the National Research Council. Prepared by the Division of Industrial Hygiene, National Institute of Health, United States Public Health Service. [Military Medical Manuals, Volume II.] Cloth. Price, \$3. Pp. 508, with 20 illustrations. Philadelphia & London: W. B. Saunders Company, 1943.

Undoubtedly the Bureau of Industrial Hygiene of the National Institute of Health must have been among the first of the official agencies to notice and respond to the extraordinary stimulus of wartime production. This manual is a reflection of the bureau's experiences in the development and application of environmental hygiene and public health methods to industry in general and to war industry in particular. The first of three sections describes the general details of setting up a medical program in a plant and the essential qualifications and functions of personnel. The discussion of plant medical facilities and medical services is excellent. There is, to be sure, some impatience with traditional methods which are regarded as not to be tolerated under circumstances affecting the efficient conduct of the war effort. At one point, for example, small plants are discouraged from employing physicians on an "on call" fee basis.

Prevention and control of disease in industry is the subject of extended treatment, both from the medical and the engineering standpoint. The contrast in space allotted to the dermatoses and to all other forms of occupational disease is rather striking, although presumably justified on the grounds of case incidence. Case finding is recognized as an important contribution of industrial medicine, especially communicable disease, but by extension the same principle applies to any defect or disability discovered under a program of industrial health examination and conservation. Problems in nutrition, fatigue, plant house-keeping and plant sanitation are all duly regarded as important factors in maintenance of the working force at the highest pitch effective production and safe practice.

The final section of the manual concerns itself with the complexion of the working force and its maximum utilization. It is concluded that every one can perform useful work, at least in some measure, unless illness in the common meaning of the term prevents. Programs for the placement of the handicapped should be conducted with this concept in mind. Employment of women in industry is viewed with equanimity, especially where medical supervision is individualized, since few, if any, occupational exposures have out and out sexual predilections. The final chapter presents all of the pertinent factors associated with sickness absenteeism.

This manual was obviously created to meet urgent wartime requirements. Its convenience and value will persist long after the emergency is over.

Strabismus: Its Etiology and Treatment. By Oscar Wilkinson, A.M., M.D., D.Sc., in collaboration with Richard W. Wilkinson, M.D., M.Sc., F.A.C.S., Instructor in Ophthalmology, George Washington University Medical School, Washington, D. C. Second edition. Cloth. Price, \$4. Pp. 369, with illustrations. Boston: Meador Publishing Company, 1943.

The present edition is thoroughly up to date, including discussion of the recent literature and other evidence of a modern attitude toward the subject. The historical remarks and discussion of anatomy and physiology of the ocular muscles cover the standard material on these subjects. Various theories of etiology are discussed, the author favoring an innervational disturbance as the most important factor in concomitant squint. In the discussion of paralytic squint the various methods of examination are described, but one is left without a very definite idea as to the author's preferred procedure in typical cases. He seems too much inclined to stress the standard diplopia tests without proper emphasis on diagnosis by the deviations on cover test.

While devoting considerable space to orthoptic training, he seems to depend greatly on surgery in treatment. He properly emphasizes the value of very early diagnosis and treatment, including early surgery when necessary. The chapters on surgery show the evidence of a large personal experience, and here the author states clearly his own opinions as to choice of

procedures and the amounts of correction possible with each. He feels it is possible, after careful study of the case, to estimate within fairly narrow limits the amounts of correction possible with each. He cautions against tenotomy of the internal recti, especially in children. Although recognizing the value of recession, for which he employs a technic of his own, he is against bilateral recession, as a rule, as likely to interfere with convergence. He prefers to all other operations his method of resection and often performs it on both external recti at one procedure. Original with the author is a metal brace which is sutured over the opposing muscle after resection to prevent pull on the resected muscle. While familiar with references in the literature to tendon transplantation and the O'Connor cinch, he has apparently had no experience with either procedure. A feature of the book is the series of illustrative cases, well illustrated and showing evidence of careful preoperative and postoperative examination. It well shows the prognostic value of a determination whether true or false retinal correspondence is present. While one might criticize some of the author's procedures in vertical deviations, especially tenotomy of the superior rectus, and could ask for a few more illustrative cases in this category, on the subject of concomitant strabismus the opinions expressed are, in general, sensible and show evidence of good judgment.

In format the book is up to modern standards.

The Reader Over Your Shoulder: A Handbook for Writers of English Prose. By Robert Graves, B.Litt., and Alan Hodge, B.A. Cloth. Price, \$3. Pp. 116. New York: Macmillan Company, 1943.

This is one of the most suggestive and enlightening books on the writing of good English that have come to our attention. Such chapters as "The Peculiar Qualities of English," "The Ornate and Plain Styles" and three chapters on "The Principles of Clear Statement" should be read and reread by every one at all concerned with the production of writing in the field of science. The second half of the book is devoted to examinations and criticisms of the writings of some of the best authors regarding the English they use, including both British and American writers, although only a few of the latter. The author's position, both as a teacher of English and as a competent writer in his own right, is so much a one of leadership that his suggestions may be taken as most authoritative.

Unbidden House Guests. By Hugo Hartnack. Fabrikoid. Price, \$12. Various pagination, with illustrations. Tacoma: Hartnack Publishing Company, 1943.

When the reviewer first saw this book he wondered who would buy it at the excessive price; after reading the book he wondered who would want it at any price. The author uses cumbersome English. He indulges in many digressions from the subject at hand, sometimes in autobiography. He is unduly critical of persons with whom he does not agree. In speaking of the work of the American Medical Association and the articles published in *THE JOURNAL*, he states that they "will continue to be poor as long as no independent work by competent scientists is done in this country." The book deals with various pests, both plant and animal, found within the home and warehouse. Part I is devoted to general matters, such as the damage done by pests, the influence of climate and other conditions on their habits and methods of extermination. Part II, entitled "Plants," includes the bacteria and molds and is rather far fetched. The colon bacillus is not ordinarily considered a household pest, while the statement concerning botulism is erroneous. Part III deals with animal parasites and insects, and part V takes up the vertebrates, such as reptiles, rodents and birds. Part IV is missing. The illustrations are numerous, many of them being of the cartoon variety.

Handbook on Medical Records. By Esther Mayo Hodges-Sherard, A.B., R.R.L., Head of Medical Record Department, Homer G. Phillips Hospital, St. Louis. Second edition. Paper. Price, \$1.50. Pp. 32. Chicago: Physicians' Record Company, 1943.

This little handbook for junior interns and medical record librarians is designed to answer questions relative to the routine for medical records. Much of the material is presented in the form of round table conferences. It is elementary and incomplete but may be helpful as an introductory textbook in some institutions.

Know Your Hay Fever. By A. P. Sperling, Ph.D., Instructor in Hygiene, College of the City of New York. With chapters on Clinical Applications by Arthur B. Berresford, M.D. Fabrirkoid. Price, \$2. Pp. 241, with 13 illustrations. New York: Frederick Fell, Inc., 1943.

For the patient who wants to know a great deal about hay fever this is a good book. It probably contains more information than many patients will want or need, but it is unlikely to disappoint any patient who looks through it for an answer to a question raised by his experience as a hay fever victim.

The book is divided into fifteen chapters, of which the first is a general introductory and explanatory chapter, detailing for the patient the symptoms which he knows all too well. The second chapter is an extensive discussion of pollens and hay fever. Chapters III, IV, V and VI deal with the differentiation of pollens and hay fever into spring, summer and fall varieties and a description of each. This is followed by a chapter on unseasonal or perennial hay fever due to diet, house dust and nonpollen types of sensitization. Then follows a chapter on the character and nature of hay fever in which the mechanism of sensitization is discussed. The next chapter deals not with the nature of hay fever but with the nature of patients and ruthlessly destroys what comfort may have accrued to the victim in the theory that he may be a genius or otherwise set apart on the superior side from his fellow human beings. A chapter is then devoted to theories of basic causes and one to the diagnosis and treatment of hay fever. A chapter follows on hay fever and the elements; that is, climatic influences on hay fever and its victims. Hay fever in various parts of the world other than the United States is described, and there is a chapter devoted to the characteristics of various well known hay fever resorts. Finally there is a disproportionately long and to the lay person not particularly useful section on research and the history of hay fever.

In general the material is excellent. It could have been presented more effectively in fewer words, and there is a question whether some of the more technical aspects have a true place in a book written for lay consumption. The section on hay fever resorts is good as far as it goes, but this reviewer, himself a hay fever victim, could have added a number of localities not mentioned by the authors. In connection with this listing of hay fever resorts, insufficient use was apparently made of maps and listings of pollen counts which have been in the literature for a number of years. To be specific, localities in Wisconsin, on the north shore of Lake Superior, are not mentioned. Minnesota's Arrowhead coast is mentioned only as a "probable" hay fever resort, whereas the fact is that it is known throughout the Middle West as excellent in this regard. This middle western area is designated as "remote." To an Easterner undoubtedly it is.

The Mechanics of Obstetrics. By Norris W. Vaux, M.D., Professor of Obstetrics, Jefferson Medical College, Philadelphia, and Mario A. Castallo, A.B., M.D., F.A.C.S., Assistant Professor of Obstetrics, Jefferson Medical College. Cloth. Price, \$4. Pp. 217, with 200 illustrations. Philadelphia: F. A. Davis Company, 1943.

This small textbook has been written as a manual for a course in manikin obstetrics. The first few chapters are devoted to the female pelvis, the fetus, presentation and position, and labor. Pertinent facts are presented in outline form. The mechanism of normal and the various abnormal presentations are described and illustrated. The indications and conditions of the common obstetric operations are enumerated and their technic is described. The manual will serve admirably in conjunction with a manikin course. The wisdom of demonstrating operative procedures to medical students is open to question. It is the feeling of many teachers that student teaching should be limited to normal obstetrics.

Huber the Tuber: A Story of Tuberculosis. By Harry A. Willmer, B.S., M.S., M.D., The University of Minnesota Medical School, Minneapolis. Introduction by J. Arthur Myers, Ph.D., M.D. Second edition. Cloth. Price, \$1. Pp. 83, with illustrations by the author. New York: National Tuberculosis Association, 1943.

This book, originally published in 1942, has been taken over by the National Tuberculosis Association and is being circulated for the great value it possesses in educating the coming generation regarding this disease. John Kieran found it both educational and hilarious. Its cleverness makes the acquiring of knowledge regarding tuberculosis easy and interesting.

Encyclopedia of Substitutes and Synthetics. Edited by Morris D. Schoengold. Cloth. Price, \$10. Pp. 382. New York: Philosophical Library, 1943.

This unique encyclopedia presents invaluable information that is not available even in the best libraries without thorough time consuming searches through the literature. The material is arranged in alphabetical order from Abalyn to Zola. Each compound is defined, and its properties, uses and substitutes are listed. Assistance was provided to the editor by seventy-five firms and four government agencies. The material is presented in a concise and readable manner and cross indexed adequately in an index of trade names and a subject index. Perhaps there is no other field of investigation that has caught the public's fancy to a greater degree than has the development of substitute and synthetic materials. This book will prove of great value to manufacturers, researchers and teachers. Its usefulness to the medical profession is evident, but it would be of added value if brief discussions on toxicity were included. Perhaps if the book progresses to a second edition a competent person or group will be invited to supply such information.

Sex in Marriage. By Ernest R. Groves, Professor of Sociology, University of North Carolina, Chapel Hill, and Gladys Hoagland Groves. Third edition. Cloth. Price, \$2. Pp. 224, with 5 illustrations by Robert L. Dicklason, M.D. New York: Emerson Books, Inc., 1943.

The third edition of this useful book retains the valuable features of earlier editions, which have enjoyed well deserved success. The book contains chapters on sex and happiness, the background of sex attitudes, sex before marriage, the sex equipment, the beginnings of marriage, the love art of the husband, the love art of the wife, some common sex problems of marriage, planned parenthood, sex and life, and books suggested for additional reading. The book is written out of the long experience of the authors with marriage and family counseling, in which they have been exceptionally successful. They have succeeded in the difficult task of giving fully all necessary information without falling into the danger of producing merely another example of erogenous reading. The Dickinson diagrams with explanatory notes are helpful. This edition can be recommended with as much confidence as its predecessors.

Methods of Treatment. By Logan Clendenning, M.D., Clinical Professor of Medicine, Medical Department of the University of Kansas, and Edward H. Hashinger, A.B., M.D., Clinical Professor of Medicine, Medical Department of the University of Kansas, Kansas City, Kansas. Eighth edition. Cloth. Price, \$10. Pp. 1,033, with 135 illustrations. St. Louis: C. V. Mosby Company, 1943.

This big book evidently has met a need and has satisfied thousands of physicians. It covers a huge field, including such branches as pediatric treatment, physical therapy, hydrotherapy and anesthesia. Doubtless wisely, the two main authors have got a number of men to help them in writing special chapters. The book is to be recommended. As would be expected from the fact that Clendenning is editor, the English flows easily.

Biochemistry for Medical Students. By William Yeale Thorpe, M.A., Ph.D. Third edition. Fabrirkoid. Price, \$4.50. Pp. 476, with 39 illustrations. Baltimore: William Wood & Company, 1943.

This synopsis of biochemistry, intended to be complementary to textbooks of physiology, contains sufficient material in condensed form to enable one to understand physiologic and biochemical processes. On one hand it contains much information for its size, on the other it lacks important details which would excite interest in reading. Cross references help to keep the book concise. It is a good attempt to give an outline of biochemistry to medical students in order to facilitate study for examinations.

Births, Infant Mortality, Maternal Mortality, 1940. Graphic Presentation. U. S. Department of Labor, Children's Bureau, Publication No. 288. Boards. Pp. 31B, with illustrations. Washington, D. C.: Government Printing Office, 1943.

This is a table of charts and accompanying maps giving births, infant mortality and maternal mortality in the United States and the several states for the year 1940. It is a strictly factual presentation, without any endeavor to account for the facts which it sets forth. It is a convenient and graphic reference compilation which should be useful to health officers, sociologists and others having to do with public health and welfare, particularly in the field of infancy and maternity.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

LACTATION IN MEN

To the Editor:—During a recent discussion I made the statement that it was possible under certain circumstances for a male to nurse a child, having read somewhere that this custom was present among a certain savage tribe. I believe that the male breast is similar to the female in a rudimentary form and that it would be possible by certain stimulation for milk to be produced without the individual necessarily being abnormal, i. e. without any endocrine dyscrasia.

M.D., New York.

ANSWER.—Several procedures are known to be used in primitive societies in order to induce lactation in men as well as in virgins and postmenopausal women. The lactogenic treatment most frequently used in these primitive tribes has consisted in direct application of irritating leaves to the breasts or, more simply, in making the infant suckle the mammary glands. It is quite possible by these procedures to produce galactorrhea, i. e. a flow of a milky or serous-milky mammary secretion. A similar phenomenon may occur spontaneously under certain physiologic conditions, such as the menopause. This secretion is, however, quantitatively and qualitatively inadequate for the infant's nourishment and growth. No instance of true lactation induced by these artificial means has ever been reported. True lactation is a rather complex and not well understood process requiring full growth of the epithelial ducts, development of the lobule-alveolar system and secretory activity of the alveolar cells of the mammary glands. These changes are the result of the interaction of a number of endocrine factors produced by the pituitary, adrenals, ovaries and placenta. Attempts to reproduce by means of synthetic endocrines the endocrine picture which is known to occur during the period of pregnancy and nursing have so far failed to induce lactation in nonpregnant men even when it leads to growth and engorgement of the mammary glands. Hence the fact that the male breast contains a system of patent ducts and rudimentary alveoli does not constitute evidence in the present state of knowledge that lactation can be produced in males. The few instances in which a milky discharge occurs in males are associated with evident endocrine disturbances such as pituitary chromophile tumor and, exceptionally, adrenal cortex carcinomas.

PAPILLARY LESIONS ON INFANT

To the Editor:—A 6 months old baby girl, white, had a lesion on the inner aspect of the arm just below the axilla. It was a papillary growth about 1.5 cm. in diameter and elevated about 1 cm. It looked just like a good many epitheliomas which I have had occasion to see. The baby also had six or eight smaller lesions on the scalp which looked more like boils not yet ready to open. There were several palpable cervical nodes. The general health and appearance of the baby were good. The mother stated that she fed well and apparently had no fever and was gaining weight. I treated the lesion on the arm with superficial x-rays, giving about 1,000 roentgens well shielded. This was about a month ago. Since that time I have repeated the procedure twice after getting the pathologist's report of a tuberculous granuloma. The section was taken just before the first treatment. The lesion has improved greatly since these three treatments. The scalp lesions may have grown a little but not rapidly. The mother states that one or two new lesions have appeared on the scalp. What shall I do about the scalp lesions? What is the probable prognosis in regard to the child? Should I take further steps to prove the diagnosis? The specimen was sent to a good pathologist, who did not seem doubtful of the diagnosis.

R. N. Long, M.D., Selma, Ala.

ANSWER.—It is impossible to make a definite diagnosis in this case without more information than is presented in the query. General pathologists sometimes need the help of experts in dermatologic histology in order to arrive at a better conclusion about cutaneous changes. It is quite possible that the lesion on the arm was, in fact, one of tuberculosis. Because of the papillary character of the lesion it could have been an example of tuberculosis verrucosa cutis. The other lesions on the scalp suggest sarcoidosis. These lesions do not break down and remain for some time before involuting. Their general histologic character resembles somewhat the changes present in tuberculous tissue. However, while there is a resemblance, the two disorders usually can be distinguished readily. Another possibility is that the scalp lesions are juvenile xanthomas. These may occur early in life and may look something like those described for this infant. It would be well to have a competent dermatologist examine this baby to arrive at a more certain diagnosis.

PHENYTOIN SODIUM FOR EPILEPSY

To the Editor:—A man aged 40 had an automobile accident about twenty-five years ago in which he suffered a fractured skull requiring trephining and ligation of an artery, from all of which he seemed to recover completely. About two years ago, twenty-three years after the accident, during a period of worry over business affairs, he had a typical epileptic seizure followed by a second a few weeks later. The patient was given capsules of phenytoin sodium and has not had any attacks since the two mentioned. However he has continued to take the phenytoin, one capsule daily. Does the prolonged use of phenytoin have any deleterious mental effect? Is it advisable to continue the capsules of phenytoin in doses of one capsule daily? Should the dose be reduced? How long should they be continued and in what doses?

M.D., Pennsylvania.

ANSWER.—Phenytoin sodium has been used regularly in some thousands of cases, and no mental deterioration has been reported. Indeed, in many "idiopathic" cases there is an improvement in the intelligence. The dosage employed is small and should not be reduced; usually the effective dose is close to the toxic dose, and this may be as high as 0.6 Gm. daily. Usually treatment with any anticonvulsant has to be continued indefinitely, as the effect of the drug is purely symptomatic; but a trial without it may be made at the end of three years, especially if electroencephalography shows a normal or nearly normal pattern.

PRECOCIOUS ADOLESCENCE AT 17 MONTHS

To the Editor:—A boy aged 17 months is rugged, active and normal in every way except that his penis is much larger than normal and hair is developing at the base. Can you name the cause and suggest any treatment if it is a known disease?

Joseph I. Grover, M.D., Dorchester, Mass.

ANSWER.—The patient described shows evidences of precocious adolescence, which has been attributed by different students to disturbances of the pituitary, sometimes involving neoplasm, or to disturbances of the pineal gland, the thymus or the adrenal cortex, or to atypical development of gonadal tissue. Rather extensive examination will be necessary in order to decide which of these is involved. At the age of 17 months this will not be too easy, but the problem is urgent because of the probability at this age of neoplasm in one of the areas mentioned. The patient should be seen in consultation by some clinician with wide experience in this differential diagnostic field before any attempt at treatment is made.

TRANSFUSION AND HYPERTENSION

To the Editor:—Will you kindly tell me whether there is any substantial reason for the use of blood plasma or whole blood transfusion in an attempt to reduce hyperpiesia?

M.D., Ill.

ANSWER.—There is no rational basis for the use of blood plasma or whole blood transfusion in order to reduce hyperpiesia. Possibly the inquirer had in mind that, by transfusion, antipressor substances might be conveyed to the recipient; but the amounts transferred in this way would certainly be too minute to have any appreciable effect.

The blood pressure of hypertensive or even normal persons will be increased if transfusions are given in large enough doses and frequently enough, on account of the increased blood volume and, when whole blood is given, also from the induced polycythemia. A well recognized treatment for hypertension is venesection, not transfusion, though the beneficial effects of the former procedure are only temporary. In fact, under ordinary circumstances severe hypertension would be a contraindication for blood transfusion because a further increase in blood volume in such patients could bring about a condition dangerous to life. If it is desired to transfuse an anemic hypertensive patient, exsanguination transfusion should be carried out, in which blood is withdrawn from one arm at the same time that the blood is infused in the other.

THERAPY FOR MUCUS OF ASTHMA

To the Editor:—Is there any remedy that will reduce the amount of sticky consistency of the mucus in asthma? I have used potassium iodide, ammonium chloride, fluidextract of lobelia, antipyrine, ephedrine sulfate, epinephrine, aminophylline and whooping cough antitoxin.

George H. Heitmuller, M.D., Washington, D. C.

ANSWER.—A prescription consisting of apomorphine hydrochloride 2 grains (0.13 Gm.), potassium iodide 5 drachms (20 Gm.) and syrup of cherry to make 4 ounces (120 cc.) taken in a dose of 1 teaspoon every four hours has been found useful in reducing the sticky consistency of the mucus in asthma. Intravenous injections of 7½ grains (0.5 Gm.) of aminophylline mixed with 1,000 cc. of 5 per cent dextrose have also been of aid, and in many cases 1 cc. of epinephrine plus a liter of 5 per cent dextrose intravenously has promptly relieved the attack. Intravenous injections of 10 cc. of aminophylline (3¾ grains, or 0.25 Gm.) have also been of great help.

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HORMONAL PRODUCTION OF ARTHRITIS

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MONTREAL

Administration of desoxycorticosterone acetate in comparatively high doses causes nephrosclerosis with increased blood pressure and disturbances in electrolyte metabolism, a fact which has been demonstrated in the chick, dog, cat, rat and monkey. Unilateral nephrectomy and a high intake of sodium chloride facilitate the production of these toxic actions of desoxycorticosterone acetate.¹ In addition to the nephrosclerosis, the most striking features of this overdosage are the formation of "Aschoff bodies" in the heart and the presence of periarteritis nodosa,² a condition occasionally seen in man following an attack of rheumatic fever. Since in addition choreiform twitches and a few rare cases of arthritis were also encountered in desoxycorticosterone acetate treated animals, it may be said that all the elements of the complex rheumatic syndrome were reproduced in the experimental animal. However, the great frequency of joint manifestations in the spontaneous disease of man and its comparative rarity in the experimentally elicited syndrome remained inexplicable. The main object of this communication is to show that changes in the internal medium of the body may determine the localization of the noxious effects of desoxycorticosterone acetate in the joints. This view is supported by observations showing that the arthritic lesions, which are rarely seen in the intact desoxycorticosterone acetate treated rat, develop with great frequency in similarly treated thyroidectomized or adrenalectomized animals especially if these are kept in cold surroundings. Indeed, under such conditions the joint changes

may be evident at a time when none of the other morphologic manifestations of desoxycorticosterone acetate overdosage have as yet become conspicuous.

EXPERIMENTAL

Since our previous experiments revealed that unilateral nephrectomy and sodium chloride treatment increase the sensitivity of rats to many overdosage effects of desoxycorticosterone acetate, all animals of the first experimental series were sensitized by ablation of the left kidney five days before injections were started. Instead of ordinary drinking water, all animals were given a 1 per cent aqueous sodium chloride solution beginning on the day of operation. Twenty-eight female albino rats, weighing 40-60 Gm., were used for this experiment. Ten of these were bilaterally adrenalectomized and 10 were thyroidectomized simultaneously with the ablation of one kidney, while the remaining 8 served as controls having intact adrenals and thyroids. All three groups received 2 mg. of finely ground desoxycorticosterone acetate crystals subcutaneously twice daily in an aqueous suspension containing 20 mg. per cubic centimeter. Their food consisted of "purina fox chow," which was complemented in the case of the thyroidectomized animals by the administration of calcium lactate powder ad libitum in order to compensate for possible parathyroid deficiency due to ablation of the internal parathyroids.

Signs of arthritis (figs. 1-3) were first noted on the fourteenth day of desoxycorticosterone acetate treatment, at which time 6 animals in the adrenalectomized group and 2 in the thyroidectomized group exhibited hyperemia and swelling in the tarsal joint region of one or both hind feet. Only occasionally did we note any macroscopically prominent swelling in other joints. The swollen regions were tender to touch. Subsequently the swelling tended to disappear and reappear somewhat irregularly, but with definite predilection for the joints of the hind feet. It should be noted that on the fourteenth day of treatment, when these joint lesions were first observed, 2 animals of the adrenalectomized group and 7 of the thyroidectomized group had succumbed from pneumonia or thyroparathyroid deficiency. In the desoxycorticosterone acetate treated control group of this series only 1 rat showed signs of mild arthritis on the fourteenth day and, while this animal recovered during the subsequent course of the experiment, another showed moderate arthritic manifestations on the twentieth day of treatment. On this day all surviving animals were killed. At autopsy macroscopic signs of nephrosclerosis, periarteritis nodosa or rheumatic nodules in the heart were observable in almost every animal of all three groups, there being no clearcut correlation between the arthritic manifestations and the

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19, Oct. 1943.
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of the lesions in the internal organs. The knee joint and one entire hind foot from each animal were taken for section. The histologic changes in these tissues will be discussed simultaneously with the corresponding material of our second experiment, which appeared to be essentially the same.

For this series 34 female albino rats, weighing 30-50 Gm., were used. All were sensitized by ablation of the left kidney and were given 1 per cent aqueous sodium chloride solution to drink on the day injections were started. We subdivided them into four experimental groups, one consisting of 10 bilaterally adrenalectomized and the second 10 thyroidectomized animals, with two control groups of 8 desoxycorticosterone acetate treated and 6 nontreated rats. The first mentioned three groups received two daily subcutaneous injections of 3 mg. of finely ground desoxycorticosterone acetate crystals in an aqueous suspension containing 30 mg. per cubic centimeter, while the fourth group received no treatment. Their diet was the same as that of the first experimental series.

The swelling was most evident in the tarsal or ankle joint region and was usually accompanied by hyperemia. Although the total number showing arthritis during the experiment was 4 in group 1, 4 in group 2 and 3 in group 3, it should be emphasized that the severity and duration of the articular lesions was much greater in groups 1 and 2 than in group 3. None of the animals of the nontreated control group ever showed any arthritis. Most deaths during the experiment were due to pneumonia. All surviving animals were killed on the twenty-sixth day. At autopsy macroscopic signs of nephrosclerosis, periarteritis nodosa or rheumatic nodules in the heart were, generally speaking, more pronounced in the adrenalectomized and thyroidectomized than in the intact desoxycorticosterone acetate treated rats and were absent in all noninjected, partially nephrectomized controls.

In view of the fact that both adrenalectomy and thyroidectomy seriously disturb thermoregulation, a group of 6 adult rats treated essentially as those of



Fig. 1.—Hind foot of a normal control rat.

Fig. 2.—Acute stage of metatarsal arthritis in an adrenalectomized, desoxycorticosterone acetate treated rat of the first experimental series. Note the swelling of the metatarsal and ankle joint regions.

Fig. 3.—Chronic arthritis localized in the distal metatarsal joints in an adrenalectomized, desoxycorticosterone acetate treated rat, in which the hormone was administered for six weeks. (This animal is taken from an earlier experimental series, which is not described in detail in this communication.)

The first signs of arthritis were noted on the tenth day of treatment, after which daily records of the joint condition were made, some of which are given in

Appearance of Arthritis in Adrenalectomized, Thyroidectomized and Desoxycorticosterone Acetate Treated Rats

Day of Treatment	Group 1 Number of Adrenalectomized		Group 2 Number of Thyroidectomized		Group 3 Number of Desoxycorticosterone Acetate Treated	
	Having Arthritis	Surviving	Having Arthritis	Surviving	Having Arthritis	Surviving
10th	2 slight	8	2 slight	7	0	8
18th	2 pronounced	8	3 pronounced	4	0	8
20th	3 pronounced	7	2 pronounced	2	2 pronounced	6
26th	1 moderate	5	1 moderate	1	1 moderate	5

the accompanying table. The arthritic manifestations subsided and recurred in the same joint or subsided in one joint only to reappear in another articulation of the same animal.

group 1 of the preceding experiment for fourteen days, but showing no signs of arthritis, was placed outdoors for twenty-four hours on a cool, windy November day. At the end of this period 3 animals had succumbed and 1 of these, as well as all survivors, had enormous tarsal swellings of the type described.

These observations, as well as the fact that in the two preceding experimental series arthritic changes occurred suddenly in a large number of animals on days when the temperature in the animal room happened to fall below the usual, leads us to assume that temperature changes play an important role in the pathogenesis of the arthritis.

A histologic analysis of the joint lesions—which were essentially identical in all groups—revealed them to be surprisingly similar to those seen in acute cases of rheumatic polyarthritis in man. Comparatively few such cases come to autopsy, but an excellent description of their pathology will be found in a pertinent com-

munication by Fahr.³ In our experimental material the acute cases show pronounced edema of the periarticular connective tissue and synovial villousities, generally accompanied by hydrarthrosis (figs. 4 and 5). In a somewhat more advanced stage the mesothelial lining of the synovial membranes disintegrates and the underlying tissue undergoes a process of hyalinization

develops which may become very cellular in some cases (fig. 7). It consists of immature large fibroblast-like, slightly basophilic cells containing voluminous vesicular nuclei. The outlines of these cells are irregular and ragged, and most of them contain only one nucleus, although some are polynuclear and resemble "Aschoff cells." While all these changes are very similar to

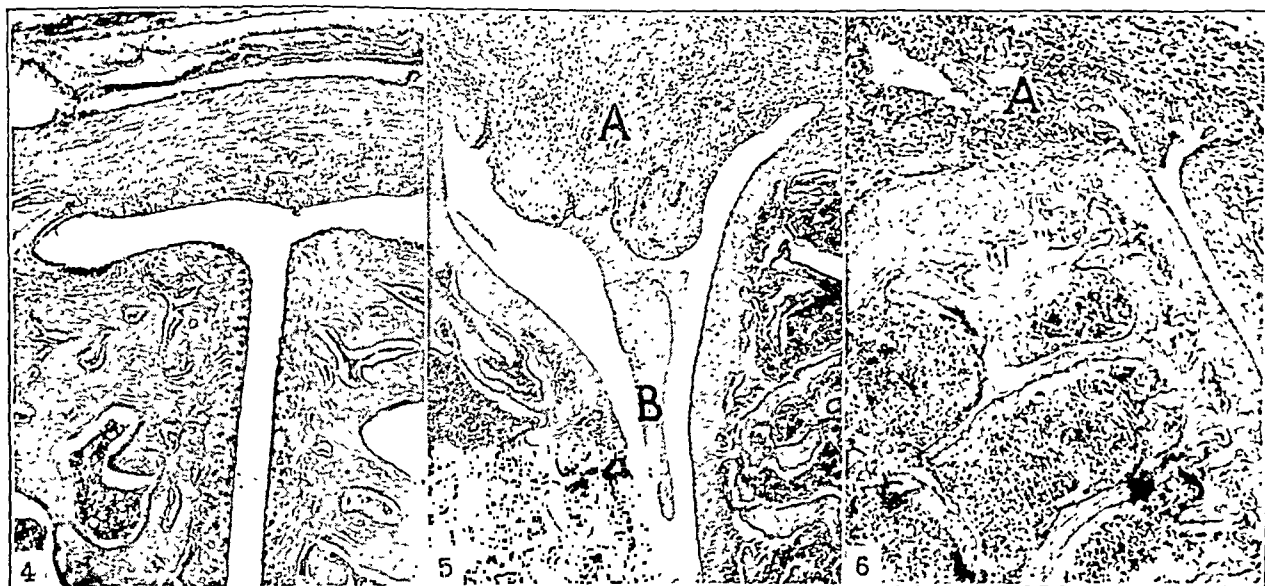


Fig. 4.—This and all subsequent photomicrographs represent sections of the metatarsal region in adrenalectomized desoxycortico-terone acetate treated rats of the first experimental series, described in the present communication. The section shows the appearance of a normal joint which shows no pathologic change in spite of treatment. Note the thin synovial membrane and the regular appearance of the underlying connective tissue. The joint cavity contains no pathologic constituents.

Fig. 5.—Acute edematous stage of arthritis. Note the swollen edematous synovial villousities (A) and the fibrinoid transudate in the joint cavity (B).

Fig. 6.—Severe arthritis with hyaline necrosis of the synovial membrane and cellular infiltration of the surrounding connective tissue (A).

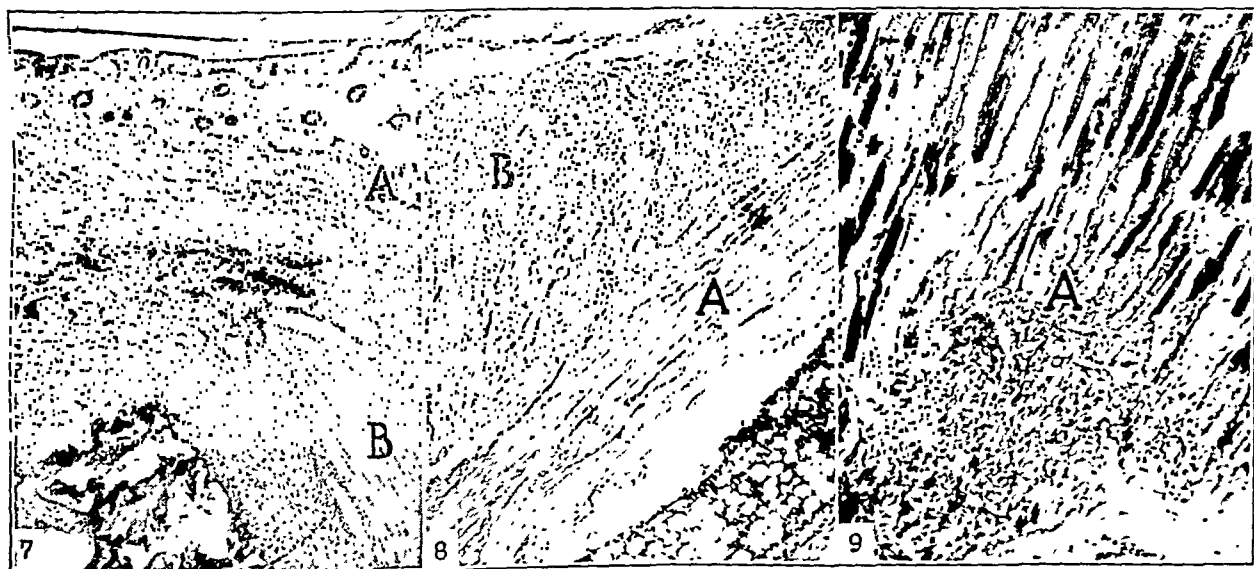


Fig. 7.—Fibrinoid necrosis and cellular granuloma in the derma underneath the epidermis (A) in the vicinity of a tendon (B).

Fig. 8.—Normal compact metatarsal bone (A) and newly formed periosteal bone (B) in a comparatively chronic case of arthritis.

Fig. 9.—Normal striated muscle fibers (top) and granulomatous nodule (bottom) from a muscle in the metatarsal region. The muscle fibers at the border of the nodule have undergone degeneration (A).

and necrosis (fig. 6). At the same time fibrinoid necrosis is also seen in the tendon sheaths and the subcutaneous tissue of the periarticular regions. Around these hyaline fibrinoid deposits a granulation tissue

those seen in rheumatic fever, we should also like to record the frequent occurrence of large round eosinophilic cells with a small dense nucleus within the granulomatous area. The exact nature of these cells is still under investigation, but they do not appear to have been seen in man.

3. Fahr, T.: Beiträge zur Frage der Herz- und Gelenkveränderungen bei Gelenkrheumatismus und Scharlach, Virchows Arch. f. path. Anat. 232: 134, 1922.

In still more advanced cases the edema subsides almost completely and the granulomatous tissue becomes increasingly dense. Infiltrations are also noted in the sheaths of the nerves in the affected regions. This may perhaps partly explain the painfulness of the lesions. Where hyalinization and granuloma formation occur in the immediate vicinity of the periosteum, new bone formation is stimulated. In such regions it appears that the eosinophilic fibrinoid deposits are gradually transformed into osteoid tissue, while the surrounding immature fibroblasts change into osteoblasts. As a result of this process, rather irregular callus-like bone proliferations arise in the periarticular regions. These changes are strikingly similar to those of the chronic hypertrophic arthritides (fig. 8). The striated muscles between the tarsal bones are frequently infiltrated by nodules of granuloma tissue similar to that seen in the synovial villi and the surrounding connective tissue. In the vicinity of such nodules the muscle fibers undergo degeneration (fig. 9).

Subcutaneous nodules, which are so characteristic of rheumatic joint diseases in man, are not very typical in our experimental animals, mainly because the subcutaneous foci tend to coalesce, thus forming rather diffuse infiltrations which may extend into the derma proper. In some instances these are reminiscent of the proliferative stage of scleroderma.

Although the knee joints did not show any obvious swelling or other macroscopically detectable change in the animals of these groups, microscopic examination revealed massive infiltration of the panniculus adiposus by a granuloma tissue similar to that seen in the vicinity of the arthritic joints of the foot. Other joints have not been examined microscopically but, judged by the lesions in the knee, it is quite possible that several articulations which showed no macroscopic change were similarly affected and sensitized by the treatment in such a manner that additional local damage (draft, cold and the like) might have provoked acute phenomena in their infiltrated tissues.

In conclusion it should be mentioned that the joint cartilages themselves were not visibly affected in any of our animals. This may explain the fact that the arthritis often regresses without leaving any permanent disability. It will be noted that in this as in most other respects the experimental joint lesions elicited by desoxycorticosterone acetate are strikingly similar to those observed in spontaneous rheumatic fever.

COMMENT

Among the various factors which were combined to produce arthritis in these experiments, the causative agent appears to be the corticoid hormone desoxycorticosterone acetate. Exposure to cold, thyroidectomy or adrenalectomy greatly facilitated the production of joint lesions but were effective only as predisposing agents. Indeed, even at room temperature desoxycorticosterone acetate had produced arthritis in a few of the animals that were neither thyroidectomized nor adrenalectomized. Furthermore, the characteristic morphologic lesion of rheumatic fever, the Aschoff nodule, was found in the heart and elsewhere after very long desoxycorticosterone acetate treatment even in the absence of organ extirpation or salt administration.⁴

The clinical and histologic similarity of the arthritis observed in our animals with that seen in the acute

rheumatic fever of man suggests that the human disease may be a clinical manifestation of adrenal cortex hyperactivity. It has often been emphasized that rheumatic fever, as well as nephrosclerosis and hypertension, tend to develop following exposure to a variety of rather nonspecific damaging agents such as exposure to cold, emotional shock and infectious diseases. On the other hand, these same agents are known to cause adrenal enlargement with histologic signs of increased cortical hormone production, a phenomenon characteristic of the "alarm reaction."⁵ It has even been found that immediately after exposure to various types of stress the corticoid hormone content of the urine rises above normal.⁶ It has also been demonstrated in rats that concomitantly with the adrenal cortex hypertrophy similar exposure to damaging agents (especially cold) causes nephrosclerosis with hypertension and that here again unilateral nephrectomy and treatment with sodium chloride exert a sensitizing effect.⁷ Although it is too early as yet to give a definite interpretation to these observations, it may be said that they are compatible with the assumption that exposure to various damaging agents stimulates the production of corticoid hormones by the adrenal cortex. This is probably a defense mechanism, since these compounds increase resistance in general. However, under certain conditions this defense reaction may defeat its purpose, as the resulting endogenous overproduction of corticoids may elicit changes similar to those produced by the exogenous administration of desoxycorticosterone acetate. Evidently this endogenous corticoid overdosage would be most detrimental to patients who are sensitized to the toxic actions of cortical hormones by renal disease or a habitually high intake of sodium chloride.

In the light of this preliminary discussion, it appears that the role of cold, thyroid or adrenal deficiency would be to favor a localization of the desoxycorticosterone acetate action in and around joints. It is not clear as yet why the joints and the periarticular tissues should become more readily affected by desoxycorticosterone acetate in the absence of either the adrenals or the thyroid, but the detrimental effect of these gland deficiencies on thermoregulation may be involved. At any rate, the present observations show that complex interrelations exist between the endocrine glands and the joints and that the adrenal and thyroid exert a demonstrable effect on the articulations.

In view of the great frequency and social significance of arthritic lesions in man,⁸ it appears desirable to correlate our experimental findings with those recorded in clinical papers. The most striking fact which emerged from a perusal of the voluminous literature on arthritis was that, in spite of the countless recorded observations of joint lesions in patients suffering from various endocrine diseases, no investigator presented

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8. The Magnitude of the Chronic Disease Problem in the United States, National Health Survey No. 6, Washington, D. C., Government Printing Office, 1935. Bigelow, G. H., and Lombard, H. L.: *Cancer and Other Chronic Diseases in Massachusetts*, Boston, Houghton, Mifflin Company, 1932.

4. Selye, Hans.: Unpublished data.

a unified concept of their pathogenesis. In the absence of any systematic review of the relevant literature, we should like to summarize the data on "endocrine arthritis" in order to expedite further clinical investigations in this field. The rheumatic and rheumatoid joint lesions will be considered together, and we shall not try to differentiate sharply between the various types of chronic arthritis (hypertrophic, atrophic, and so on). As suggested by some of our results (compare figures 2 and 3), it appears quite possible that, depending on the acuteness or chronicity of the condition or other incidental factors, the same etiologic agent may manifest itself in different ways and give rise to different types of arthritis. However, the purulent arthritides with demonstrable microbial contamination of the joint cavities will not be considered here, as they are obviously not of endocrine origin.

For the evaluation of our experimental results, special interest is attached to those clinical observations which tend to correlate arthritis with thyroid or adrenal deficiency. Hypothyroidism appears to influence the joints in a rather specific manner. Since Kocher⁹ developed his concept of "rheumatismus thyreoprivus chronicus," the frequency of rheumatic and especially rheumatoid conditions in frank myxedema and latent hypothyroid conditions has been established by numerous observations.¹⁰ In those cases in which arthritis appears in combination with signs of thyroid deficiency and a decreased basal metabolic rate, thyroid medication often proved of great value.¹¹

Although clinical observations also reveal the possibility of producing arthritis with thyroid hormone¹² we have been unable to do so in animal experiments up to the present. However, it is perhaps pertinent to mention that thyroxin overdosage is effective in causing nephrosclerosis and hypertension especially in the unilaterally nephrectomized sodium chloride treated rats and in this respect resembles desoxycorticosterone acetate overdosage.¹³

A deficiency of the adrenal gland has not been seriously considered by clinicians as playing a role in the production of arthritis, although in Addison's disease¹⁴ and in status thymicolymphaticus¹⁵ arthritis has been recorded.

Surprisingly, joint lesions have also frequently been reported in cases of either thyroid or adrenal hyperactivity. Thus frank toxic diffuse goiter is often accompanied by acute or chronic arthritis and in such cases thyroidectomy or x-ray treatment of the thyroid region

proved beneficial.¹⁶ Similarly chronic arthritides are frequent complications of Cushing's disease in which the adrenal cortex is usually hyperplastic or adenomatous.¹⁷ In conclusion, the most prominent fact about the clinical syndrome of endocrine arthritis is that both hyperfunction and hypofunction of several endocrine glands may elicit joint manifestations.

Among the joint lesions which do not appear to be directly related to the thyroid or adrenals, the chronic arthritides, periarthritides and arthralgias of the menopause received particular attention because of their great frequency and practical importance.¹⁸ According to Charcot¹⁹ 8 to 10 per cent of women between 40 and 60 years of age suffer from arthritis as against 1 to 2 per cent of old men. Among 1,000 menopausal women investigated by the Council of the Medical Women's Federation²⁰ 23.7 per cent exhibited evidence of "arthritis and fibrositis." The British Ministry of Health points out that between the ages of 37 and 54

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anticipated and, furthermore, as a rule the rise that was obtained proved to be only temporary."

On the other hand, Rosenthal's experimental studies⁹ suggest that electrolyte solutions deserve reconsideration. In an extensive series of well controlled experiments in mice, Rosenthal recently found that in acute burn shock "mouse serum intravenously was slightly less active than equivalent volumes of 0.9 per cent NaCl orally. Little effect was observed from the intravenous administration of a hypertonic solution of human serum albumin. . . . it is possible to correlate the degree of effect of this preparation and of mouse serum with the sodium contained in the doses administered. . . . It was demonstrated that serum was slightly more effective when given orally than

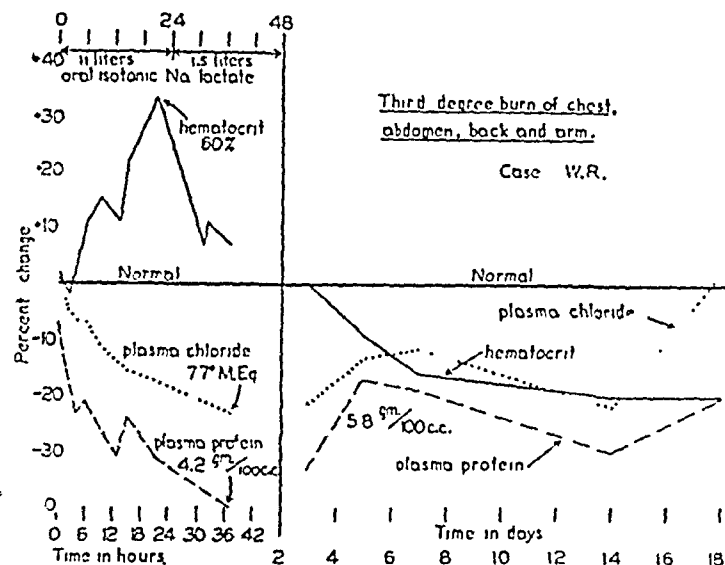


Fig. 2.—Changes in the blood after treatment with oral sodium lactate in patient W. R. with extensive full thickness burns (weight 64 Kg). Horizontal axis, time after the burn: hours up to forty eight, then time in days. Vertical axis, percentage change in hematocrit, plasma proteins and chlorides from the normal range, which is indicated by the center horizontal line. This "normal" line represents hematocrit value of 45 per cent, plasma protein of 7 Gm. per hundred cubic centimeters and plasma chlorides of 103 milliequivalents per liter. The amount of sodium lactate solution administered is shown in the upper left border of the chart. Solid line, hematocrit; dotted line, plasma chloride; broken line, plasma proteins. The chart shows the progressive rise in hematocrit after the severe burn, the decrease in plasma proteins with subsequent increase on the fifth day without administration of any plasma and the decrease in plasma chlorides, which remained low for fourteen days.

intravenously."^{9a} Saline solution intravenously was less effective than by mouth; isotonic dextrose solution was without effect.¹⁰ It is of interest that in 1926 Davidson¹¹ wrote of "the indefinite term 'shock'" and "the equally vague term 'toxemia of burns'" when he described the "striking alteration of chloride metabolism in cutaneous burns." On the basis of his observations, that the plasma chlorides of such patients were low and the urine almost devoid of sodium chloride for as long as three weeks after the burn, in spite of adequate salt intake, he advised the administration of sodium chloride in severe burns instead of dextrose solutions.¹² In extensive burns he administered as much as 10,000 cc. of isotonic saline solution in twenty-four hours by three routes: subcutaneous, intravenous and rectal.¹³

Since extensive third degree burns were being studied to evaluate a new local therapy,¹⁴ it was decided on the basis of these facts to try treating burn shock with oral sodium lactate¹⁵ instead of plasma. The results with this simplified therapy have proved so successful that this preliminary report is presented.

PROCEDURE

The procedure used in this study is briefly as follows: Morphine sulfate $\frac{1}{4}$ grain (0.016 Gm.) by hypodermic injection was administered on admission for severe pain (less to children). Blood was taken at once for immediate and subsequent analyses. The patient was placed on and covered with a sterile sheet, but no blankets nor heat were applied.¹⁶ Large amounts of the chilled isotonic (one sixth molar) 1.75 per cent sodium lactate solution were given by mouth at once and at fifteen minute intervals thereafter on schedule. This solution was prepared by emptying a bottle previously filled with 72 Gm. of sodium lactate syrup into a 4 liter bottle, which was then filled with cold tap water. Sodium lactate syrup varies in composition, frequently containing but 60 to 65 per cent of sodium lactate, in which case 110 Gm. is used. Storage of large quantities of the isotonic solution, which may become sour, was thereby avoided. The burns were rapidly freed of any loose tissue, covered with the local application¹⁷ and bandaged. Blood pressures and repeated samples of blood were taken at frequent intervals during the first twenty-four hours. A careful record of fluid intake is imperative, and an exact schedule is used so that approximately 7 to 10 liters (from 10 to 15 per cent of body weight) of the isotonic sodium lactate are administered within the first twenty-four hours. Any vomiting (which frequently occurs in severe burns¹) was treated by administration of more fluid. Frequently a small Levine tube was passed through the nose and connected with a drip apparatus, so that the sodium lactate was administered constantly. The urinary output was carefully watched and all urine collected. Fluid administration in the subsequent days was adjusted to obtain 1 to 2 liters of urine daily. When food was tolerated, a high protein diet was given supplemented in extensively burned patients by 50 to 100 Gm. daily of amino acids.¹⁸

¹⁴ Fox, C. L., Jr.: Neutralized Tannate and Ionized Sulfonamide for the Local Treatment of Burns, to be published. The following preliminary reports are available.

¹⁵ Hayden, Reynolds: Use of Sulfonamides, J. M. Soc., County New York, July 21, 1942, vol. 1.

¹⁶ Hayden.³

¹⁷ Bullowa, J. G. M., and Fox, C. L., Jr.: Newer Conceptions of the Treatment of Burns, Hebrew M. J. 1: 192, 1943.

¹⁸ Sodium lactate was selected in the beginning because in Rosenthal's⁹ experiments it appeared slightly superior to other sodium salts. Although this superiority may be negligible, we have continued to use lactate because it is well taken by adults, does not seem to provoke vomiting and yields the satisfactory results referred to in this paper. It also helped to counteract the acidosis and to induce formation of an alkaline urine, thereby avoiding renal precipitation of sulfonamides (Fox, C. L., Jr.; Jensen, O. J., and Mudge, G. H.: The Prevention of Renal Obstruction During Sulfadiazine Therapy, J. A. M. A. 121: 1147 [April 3] 1943). The extent of conversion of lactate to bicarbonate is yet uncertain, but no chemical nor clinical evidence of alkalosis was noted in our cases. A more physiologic solution would contain sodium chloride. Such solutions are under study at the present time.

¹⁶ Rosenthal, S. M.: Effects of Local Therapy on Mortality from Shock, Pub. Health Rep. 57: 1923 (Dec. 18) 1942. Environmental Temperature and Mortality in Burns, editorial, J. A. M. A. 121: 1353 (April 24) 1943.

¹⁷ The local treatment of these patients consisted in the application of neutralized (pH 7.6) tannate-sulfadiazine ointment,¹⁴ which was covered with a layer of sterile old linen, then overlaid with gauze pads and bandaged snugly but not tightly, i. e. a "pressure" bandage was not used. This ointment contains 5 per cent of tannic acid as neutral tannate and 3 per cent of sulfadiazine or sulfathiazole as soluble salts, both made by addition of sufficient alkali to raise the pH to 7.6. This mixture is then added to a water soluble stearate base with a continuous aqueous phase. The W. R. Warner Company compounded this ointment for us.

¹⁸ The oral amino acids (Oramin) were generously provided by the William R. Warner Company, New York. Although some of these patients were in bed for four months and underwent up to eight skin grafting operations, their plasma proteins were maintained with only occasional preoperative transfusions; no malnutrition edema was encountered.

⁹ Rosenthal, S. M.: Chemotherapy of Burns and Shock. III. Effects of Systemic Therapy on Early Mortality, Pub. Health Rep. 58: 513 (March 26) 1943; footnote 9a.

^{9a} Rosenthal, S. M.: Experimental Chemotherapy of Burns and Shock: IV. Production of Traumatic Shock in Mice; V. Therapy with Serum and Sodium Salts, Pub. Health Rep. 58: 1429 (Sept. 14) 1943.

¹⁰ Desoxycorticosterone, adrenal cortex extract, epinephrine or posterior pituitary injection subcutaneously were also without benefit.

¹¹ Davidson, E. C.: Prevention of Toxemia of Burns: Treatment by Tannic Acid, Am. J. Surg. 40: 114-116 (May) 1926.

¹² Davidson, E. C.: Sodium Chloride Metabolism in Cutaneous Burns and Its Possible Significance for a Rational Therapy, Arch. Surg. 13: 262 (Aug.) 1926.

¹³ Davidson, E. C.: Tannic Acid in the Treatment of Burns, Surg., Gynec. & Obst. 41: 202 (Aug.) 1925.

Blood samples were analyzed by "hematocrit" for relative cell volume and the plasma for total protein, albumin:globulin ratio, chlorides, carbon dioxide combining power, sodium, cephalin flocculation capacity, amylase, icterus index, direct and indirect bilirubin, sugar and urea. The urine was analyzed for sodium, chlorides, sulfonamide, tannates, creatinine and creatine.

RESULTS

All cases of thermal burns admitted to Harlem Hospital since Feb. 1, 1943 and 1 case of severe burns admitted to the Babies Hospital have been treated according to this procedure. There was no selection of cases; 12 additional cases of partial thickness (second degree) burns are omitted from this report. Certain data relating to the patients with full thickness (third degree) burns who have been treated are summarized in table 1. Figure 1 indicates the location of the third degree, full thickness burns and the areas that were skin grafted¹⁹ in certain cases. The following typical cases illustrate the course of events:

W. R., a man aged 43, was admitted to Harlem Hospital at 1:35 a. m. just after having been burned by fire while asleep. The chest, anterior abdominal wall, left side, entire back, left axilla and left arm and right buttock presented the hard, brawny edema with lifeless skin characteristic of third degree burns and constituted 35 per cent of the body surface (W. R. in figure 1). All these areas required skin grafting. The neck, left forearm and hand and left buttock were blistered and showed deep second degree burns. These areas healed without grafting. Relevant data are summarized in figures 2 and 3. Blood pressure, 70 systolic, 50 diastolic on admission, remained low for eight hours, then increased to normal range.²⁰

B. S., a girl aged 8 years, was admitted to the Babies Hospital at 9 p. m. just after having set fire to her clothing while playing with matches. The right side of her chest, both upper arms, the right axilla, the back from the neck to the buttocks and involving the right buttock, the right thigh and part of the right leg were burned. There were few blisters; the full thick-

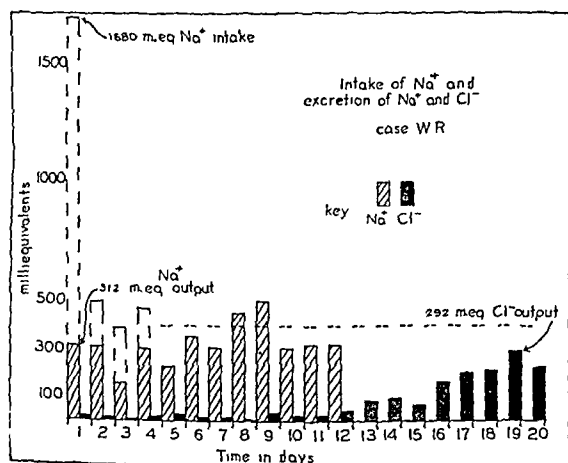


Fig 3—Sodium and chloride balance in aforementioned case. Horizontal axis, time after the burn; vertical axis, quantity of sodium or chloride in milliequivalents. The sodium intake in the form of lactate is shown by the area in the box with interrupted lines. The sodium excretion is much less than the intake. The deficit on the fourth day exceeds 1,000 milliequivalents of sodium; note the increased excretion of sodium (after therapy had ceased) on the eighth and ninth days. The chloride excretion is seen to be much less than the intake of sodium chloride (indicated by the interrupted horizontal line) until after the sixteenth day, when the output approaches normal.

ness (third degree burn) appeared to involve approximately 22 per cent of the body surface. The relevant data of this case are summarized in figures 4 and 5.²⁰

These results illustrate the rising hematocrit reaching the peak of 58 to 60 per cent from four to approximately twenty hours after the burn, and the steady decline in chloride²¹ and proteins. The "shock" blood pressure approached normal while the hematocrit was still high; the "hemoconcentration" was actually a

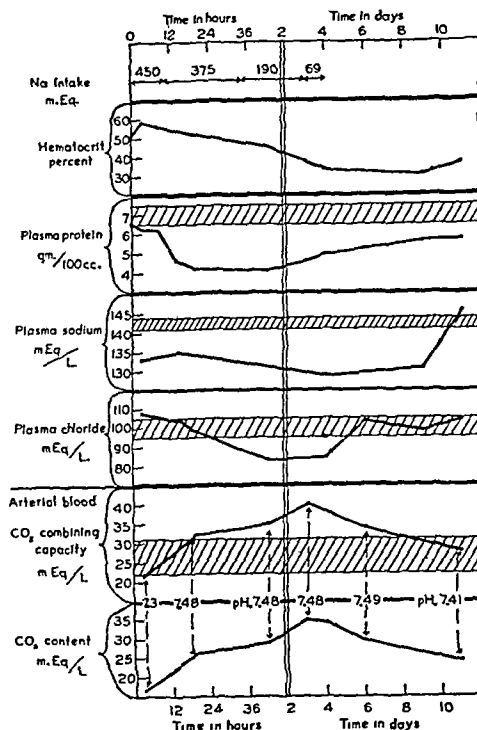


Fig 4.—Changes in severe burn case treated with oral sodium lactate (B. S.) (weight, 26 Kg.). The areas with sloping lines indicate the average normal range. The amount of sodium retained is shown at intervals at the top of the chart (amount vomited was subtracted). The plasma protein concentration dropped but subsequently increased without administration of plasma. The pH was computed from the carbon dioxide measurements on arterial blood by using the Henderson-Hasselbalch equation $pH = 6.1 + \log \frac{HCO_3^-}{H_2CO_3}$. The values for carbon dioxide content were obtained on whole arterial blood for experimental reasons²² and are not directly relevant in this study. The carbon dioxide combining capacity was computed by alignment charts and is graphed with the normal range indicated by the shaded area. There was an initial uncompensated acidosis corrected by sodium lactate therapy. The slight alkalosis that followed was of the compensated type. The plasma sodium was low on admission (133 milliequivalents per liter) and decreased to 129 milliequivalents per liter on the third day. On the fifth and ninth days the plasma sodium was 130 milliequivalents per liter and on the eleventh day it was normal at 145 milliequivalents per liter.

decrease in the concentration of plasma proteins and chlorides accompanied by increased relative erythrocyte volume. There was comparatively little surface oozing although the brawny edema was prominent and extensive. (It is not yet possible to assess the relative benefit of this systemic therapy and the neutralized [pH 7.6] tannate-ionized sulfadiazine ointment in preventing loss of fluid from the surface. The local treatment of patient B. S. was a sulfathiazole emulsion; the oozing was much less than had previously been noted in similar cases treated with plasma.) It is significant that the right hand and arm of W. R. and the left thigh and leg of B. S.—not burned—at no time showed any edema despite the ingestion of large volumes of isotonic fluid and the transient low plasma protein concentrations of 4.2 Gm. per hundred cubic centimeters. It is of further interest that these low levels on the second day steadily increased to the normal range without administration of any plasma.

21. The decline in chloride undoubtedly was due at least in part to the large amount of lactate given. Sodium determinations in case B. S. and other cases have shown that there is at least a pronounced fall in the sodium concentration of the plasma despite the large amount of sodium administered.

19 Fox, C. L., Jr., and Tamerin, J. A.: The Use of Soluble Sulfonamides in Extensive Third Degree Burns, *Bull. New York Acad. Med.* 19: 669 (Sept.) 1943.

20 The data are also tabulated in the author's reprints.

In general, the large volumes of fluid were well tolerated; the patients wanted water to drink but after a short time became accustomed to the lactate and drank copiously of their own volition. Occasionally, frequent vomiting occurred and was treated by passing a Levine tube and administering the lactate by steady drip. When the initial vomiting persisted, intravenous infusion was used temporarily to support the circulation until the stomach became adjusted to receiving the steady flow of sodium lactate. (For the temporary infusion in emergencies, sterile saline solution may be used if sterile one-sixth molar sodium lactate is not immediately available.) It is possible that a smaller volume of isotonic fluid is actually necessary, but in the present state of knowledge, until urine secretion begins, it is difficult to gage the amount to give. Since Rosenthal⁹ found hypertonic solutions less effective than isotonic, capsules of salt followed by water were not used.

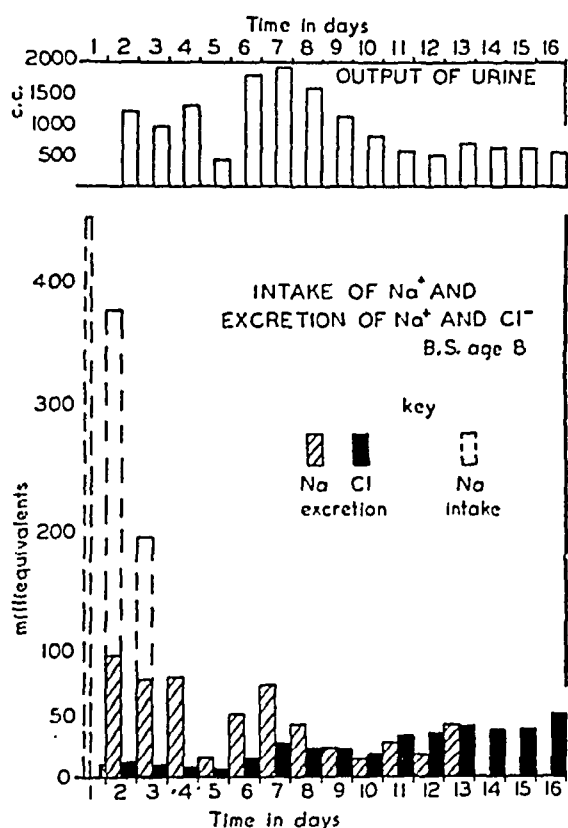


Fig. 5.—The intake of sodium ion is shown by the height of the interrupted lines (the width on the first day is narrowed to indicate the shorter time interval from admission at 9 p. m. to 7 a. m.). At the end of the fourth day the sodium intake exceeded the sodium output by over 800 milliequivalents. The chloride excretion, which approached normal by the sixteenth day, was far below the average daily intake of 100 milliequivalents. The brief duration of oliguria is shown. The diuresis on the sixth to eighth days coincided with the disappearance of edema in the burned regions.

It is also worthy of note that in these cases copious urinary output occurred from six to twelve hours after therapy was begun. Albuminuria did not occur. Furthermore, the nonprotein nitrogen values in the blood did not become elevated. This is in pronounced contrast to the oliguria, albuminuria and azotemia characteristic of burns treated by other methods.¹

COMMENT

Owing to the fact that from one to eight skin grafting operations²² were required in these cases, the extent of full thickness burns could be definitely ascertained. The results in these severe burns constitute *prima facie*

evidence of the therapeutic efficacy of large amounts of oral sodium lactate instead of intravenous plasma.

The biochemical changes involved have only begun to be studied. In a preliminary abstract, Wilson and his collaborators²³ noted that the sodium in the blood plasma in the veins leaving burned areas was lower than the sodium concentration of the inflowing blood plasma. Scudder has emphasized the need for large doses of sodium chloride to combat the rise in the plasma potassium concentration which he noted occurred early in burns.²⁴ Harkins¹ reproduced data from Wilson's clinical papers which show definite reduction in blood chlorides but withheld comment. Rosenthal's experiments⁹ bring the significance of disturbance in sodium/potassium balance into sharp focus, and the present clinical data give some indication of the magnitude of the disturbance.

As seen in figures 3 and 5, despite copious urinary output the huge quantity of sodium and fluid administered was not promptly excreted but was retained in the body and gradually appeared in the urine over a ten to twenty day interval. In other words, there was distributed within these patients a volume of fluid isotonic with respect to sodium which represented approximately three fourths or more of their normal volume of extracellular fluid (plasma plus interstitial fluid).²⁵ Similar findings were noted in the other cases of extensive burns.

In addition, Davidson's observations on the disappearance of the chlorides from the urine¹² were strikingly confirmed. It is for this reason that 1 case of second degree burns is cited (last case, table 1), because there too the plasma chlorides dropped significantly and the urinary chlorides fell to zero and remained depressed for ten days after the burn.

Further studies of the redistribution of sodium are in progress. It is, however, pertinent to mention here that experiments on the distribution of radioactive sodium administered to shocked animals revealed that enormous quantities of sodium entered the injured muscle and skin.²⁶ Normally skin contains little sodium, and muscle considerably less.²⁷ The depletion of the blood of sodium by the injured tissues has been suggested²⁶ as the chief cause of the "deficit in blood volume" recently described as "the anatomical factor immediately responsible for circulatory failure" in all types of shock.²⁸

Extension of these studies may answer the important question as to whether a judicious combination of small amounts of plasma with sodium lactate might be more effective than sodium lactate alone. Plasma can supply protein as well as salt, but the amount of plasma required to supply the necessary sodium would exceed 10,000 cc., an amount not readily administered intravenously. The function of plasma is twofold: to augment the effective circulating blood volume and to increase the concentration, and hence the osmotic pressure, of

23. Lowdon, A.; McKail, R.; Rae, S.; Stewart, C., and Wilson, W. G.: Changes in Sodium and Other Constituents of Blood and Extracellular Fluids Following Scalds, *J. Physiol.* **96**: 27, 1939.

24. Scudder, J.: *Blood Studies as a Guide to Therapy*, Philadelphia, J. B. Lippincott Company, 1940.

25. Gamble, J. L.: *Chemical Anatomy, Physiology and Pathology of Extracellular Fluid: A Lecture Syllabus*, Boston, Spaulding-Moss Company, 1942.

26. Fox, C. L., Jr., and Keston, A. S.: The Electrolyte and Water Changes in Shock Traced by Radioactive Sodium, to be published.

27. Hastings, A. B., and Eichelberger, L.: The Exchange of Salt and Water Between Muscle and Blood, *J. Biol. Chem.* **117**: 73, 1937. Harrison, H. E.; Darrow, D. C., and Yannet, H.: The Total Electrolyte Content of Animals and Its Probable Relation to the Distribution of Body Water, *ibid.* **113**: 515, 1936.

28. Courmand, A.; Riley, R. L.; Bradley, S. E.; Breed, E. S.; Noble, R. P.; Lauson, H. D.; Gregersen, M. I., and Richards, D. W.: Studies of the Circulation in Clinical Shock, *Surgery* **13**: 964 (June) 1943.

22. The numerous skin grafting operations in these cases were carried out by Dr. Joseph A. Tamerin, with the assistance of Dr. Samuel C. McKinney and Dr. Arthur Garnes, by a technic described elsewhere (Whipple, G. H.: *Basic Principles in the Treatment of Thermal Burns*, *Ann. Surg.* **118**: 187 [Aug.] 1943; discussion, p. 192. Fox and Tamerin.¹).

plasma proteins. How permanently therapy with large amounts of plasma alone accomplishes these ends needs further study; this need is suggested by the previously mentioned observations of Scudder and Elliott,⁷ of Rhoads, Wolff and Lee⁸ and of Elman⁹ together with the recent experiments of Fine, Seligman and Frank²⁹ using radioactive plasma. It appears plausible from our results that by greatly increasing the volume of interstitial fluid the diminished plasma volumes in shock can be restored. For example in case B. S. the low initial plasma volume of 720 cc was raised to the normal range (1,170 cc.) by this therapy without plasma. In addition, more accurate evaluation of the actual loss or withdrawal of plasma proteins from the

Whatever may be the ultimate conclusion about the added benefit of small amounts of plasma, the fact that extensively and severely burned patients survived and recovered after the oral administration of isotonic sodium lactate instead of the intravenous injection of plasma proves that correction of the sodium imbalance is of major importance. W. H. and S. M. were the first patients treated. As experience had not yet justified full confidence in the method, each received 200 cc. of plasma. There is no reason to believe that this small amount of plasma contributed to the favorable outcome. No plasma was used in any of the other cases.

The simplification in the care of such patients is worth noting. Intravenous therapy is dispensed with

TABLE 1—Summary of Third Degree Burns* Treated Initially with Oral Sodium Lactate Instead of Plasma

Case, Sex, Age	Area Third Degree Burn Percentage by Berkay Scale	Laboratory Data	First Skin Graft (Days After Burn)
W R ♂ 40	Chest, abdomen, entire left side, left arm including axilla, back, right flank, both buttocks 56%	Hematocrit 60% on 2d day; total protein 42 Gm per 100 cc and chlorides 76 mEq 2d day. see table 2 for complete details	First operation on 45th day; 2d operation on 62d day; six additional operations to resurface completely; discharged healed on 153d day
W H. ♂ 0	Entire right arm, forearm, fingers (olecranon process and flexor tendons at wrist exposed), chest, abdomen, inner aspect of both thighs and groins, penis (circumcised by burn), upper part of scrotum a continuous burn; right side and flank, 41%	Hematocrit 51% on 3d day, chlorides 89 mEq on 3d day, total protein 65 on admission to 47 Gm per 100 cc on 3d day	First skin graft 39th day; four subsequent operations, discharged on 112th day, healed
S M ♀ 7	Right arm, left arm, upper forearm, both thighs lower chest, abdomen, right flank, side of chest, right lower back, 34%	Hemoglobin 118% 2d day; chloride 69 mEq on 10th day; total protein to 52 Gm per 100 cc on 5th day	First skin graft 44th day; three subsequent operations; discharged 136 days, healed
B S ♀ 8	This case treated at the Babies Hospital, New York. Entire back, both upper arms, right axilla and right chest, left buttock, right thigh 4%	Hematocrit 59%; plasma proteins dropped to 42 Gm per 100 cc and chlorides to 83 mEq, plasma volume 720 cc on 1st day increased to 1,170 cc after therapy; see table 3 for complete details	5% sulfathiazole emulsion used, surface oozing through dressings less than in similar cases treated with plasma; dermatone grafts placed in four operations, discharged healed on 86th day
M H ♀ 37	Left arm, forearm, hand and fingers (except palm); left side and axilla, both legs, both outer thighs and buttocks, 32%	Hematocrit 30% on 1st day to 38% on 4th day, chlorides 85 mEq on 3d day	First skin graft 24th day; died 13 days postoperatively, 35 days after admission; hematuria, hypernephroma?
G J ♀ 5	Left arm, axilla, left half of chest and abdomen, left half of back to midline, 24%	Total protein to 525 Gm per 100 cc; chlorides 9, mEq on 2d day	First skin graft on 31st day; two additional operations; healing on 75th day
A G ♀ 30	Both buttocks, both thighs, left leg third degree areas on both thighs and legs, 19%	Hematocrit 547%; plasma chlorides dropped to 87 mEq, urine chlorides 0.14 Gm in 24 hrs	Patient refused grafting operation, granulations healing slowly at 2 mos still in hospital
M B ♀ 1	Face, all extremities, thorax, abdomen and back: 80%; pulmonary edema	Admission values normal	Admitted in pulmonary edema with carbon monoxide poisoning; died in 4 hours
C G ♂ 29	Case with second degree burns only. Left arm, shoulder, upper half of back. All deep second degree burns; 16%; this case is included because of pronounced shock, blood pressure 90/50 and opportunity for complete blood studies	Hematocrit to 51% 2d day; total protein dropped from 66 (adm) to 61 on 3d day, chlorides dropped from 112 mEq (adm) to 89 mEq on 4th day with no chloride in urine	No grafts needed; discharged on 17th day, healed

The percentages refer to third degree area only (except C. G. above). It is of interest to compare these cases (9 additional cases appear in the author's reprints) with the not dissimilar group of 10 burn cases which required skin grafting following the Coconut Grove fire.⁴ The burns in this group including first and second degree areas were reported to range from 85 to 56% of body surface. A total of 63 units of plasma was used in the first 3 days for the 10 patients. Since this table was compiled, 6 additional patients with extensive full thickness (third degree) burns and 3 patients with some partial thickness burns have been treated with sodium lactate. All recovered from shock and showed the typical blood and urine changes described.

circulation is essential. It is possible that in our cases external plasma loss was reduced by the neutralized tannate ionized sulfadiazine ointment applied locally¹⁴ without pressure bandages. The recent studies of Drinker,³⁰ however, have demonstrated the high protein content of the increased quantity of lymph obtained by cannulating lymph ducts draining burned extremities. It is possible that plasma proteins not actually lost from the surface may be returned relatively soon to the blood stream via the lymph channels, particularly in view of the delayed clotting when no pressure is used.³¹ (Comparative observations indicate substantially greater surface loss of plasma in plasma treated cases than in sodium lactate treated cases.)

and the medical staff and nurses are relieved of this burden. The sodium lactate costs but a few cents and the hospital supplies of blood and plasma are conserved. The problems of sterile solutions are eliminated.

It is scarcely necessary to mention the military advantages of the simplification of shock therapy that would follow conclusive demonstration of the efficacy of this treatment of burn shock.³² For the present at least, the emergency use of this method under circumstances in which plasma is not immediately available seems clearly indicated.

This preliminary report will be followed by a more detailed report in which studies of the circulation by the shock group²⁸ will be combined with measurements

²⁹ Fine, J., Seligman, A. M., and Frank, H. A. Traumatic Shock, *Ann Surg* 118: 238 (Aug.) 1943.

³⁰ Glenn, W. W. L., Moos, T., and Drinker, C. K. Observations on the Physiology and Biochemistry of Quantitative Burns, *J Clin Invest* 22: 451 (May) 1943.

³¹ Glenn, W. W. L.; Gilbert, H. M., and Drinker, C. K. The Treatment of Burns by the Closed Plaster Method, with Certain Physiological Considerations Implicit in the Success of This Technique, *J Clin Investigation* 22: 609 (July) 1943.

³² Rosenthal⁴ has recently developed a technic for the experimental production of uniformly fatal traumatic shock by means of tourniquets. Therapeutically isotonic solutions of sodium salts were more effective than equal volumes of plasma. Plasma was slightly more effective by mouth than by vein. Similar experiments with radioactive sodium in this type of shock showed the enormous deposit of sodium in traumatized tissues,² analogous to the redistribution following thermal burns but quantitatively of greater magnitude.

would appear to be adequate quantities of dextrose. In no instance except one was there spontaneous remission of the attacks. In this exceptional case (Gray⁶) attacks subsided after removal of the pancreatic tumor where hepatic metastases were present. This patient received large amounts of dextrose postoperatively but died six weeks after excision, and the cause of death was not clearly apparent. Since some islet cell carcinomas have been observed not associated with hyperinsulinism, a plausible explanation for the situation is that only the cells of the primary growth retained insulin producing properties, whereas the metastatic growths did not retain these properties.

The evidence for symptomatic improvement in the case cited in detail is as follows: Attacks of hyperinsulinism recurred after exploratory laparotomy and biopsy had revealed hepatic metastases of the previously

therefore have been predicted on the basis of the animal studies that a series of injections in this case would have resulted in temporary improvement with return of attacks. This, as stated, is what did occur.

Two other features of the case deserve special mention: 1. As a result of repeated attacks of hyperinsulinism a tolerance to low blood sugar levels developed. The patient was able to conduct himself normally with blood sugars as low as 20 mg. per hundred cubic centimeters. His "attack level" was 14 mg. per hundred cubic centimeters or less. 2. Forced ingestion of food in an attempt to ward off attacks resulted in a 35 pound (16 Kg.) weight gain over a period of seven months after carcinomatosis of the liver was observed at laparotomy. This would indicate that "carcinoma cachexia" is merely the result of gradual reduction in caloric intake and not due to a "toxemia" originating from the tumor cells. Thus successful forced nutrition in some cancer patients should prove to be of palliative value. As already indicated, man appears much more resistant to the action of alloxan than the rabbit or the dog. Furthermore, in man no evidence of injury to the convoluted tubules of the kidney was observed, whereas in animals this was a frequent finding.

Injury of the insulin producing system of an islet cell in itself does not signify that the cell as a whole might be fatally injured, in that it might well be possible to inhibit insulin production while the cells continue to survive and to proliferate. Studies in animals would suggest that the cell itself as well as the insulin producing mechanism is injured by alloxan. However, in the case reported the normal and neoplastic islet cells were not necrosed but there was temporary inhibition of insulin production. How significant this substance may prove to be in the symptomatic and palliative treatment of one specific type of cancer (insulin producing islet cell carcinoma) can be demonstrated only after further trial and more prolonged observations. Temporary relief from attacks of hypoglycemia in itself would constitute effective palliation. Alloxan might afford beneficial effects, at least temporary, in those patients with recurring hyperinsulinism after operation at which an islet cell adenoma is not found and pancreatic tissue is removed without lasting benefit.

SUMMARY

1. Alloxan, the ureide of mesoxalic acid, also a component of the uric acid molecule, has been observed to produce specific necrosis of the islets of Langerhans in the rabbit and dog with resultant hyperglycemia. Similar histologic effects were not observed in patients receiving larger doses.

2. Alloxan was administered as a chemotherapeutic agent to a patient with insulin producing islet cell carcinoma, metastatic to the liver, who presented recurring attacks of hyperinsulinism increasing in frequency and severity. The rationale for this was that, since the radiosensitivity of tumors roughly parallels the radiosensitivity of the normal tissues from which they arise, a chemical agent exerting specific noxious effects on normal pancreatic islet cells might influence favorably insulin producing islet cell carcinoma.

3. Temporary symptomatic relief was obtained in that the attacks were obviated for brief periods following each series of injections. Death resulted from a complication at laparotomy. Alloxan did not cause necrosis of the malignant islet cells.

AUGUST						
Sun	Mon	Tues	Wed	Th	Fri	Sat
22†	23†	24	25	26	27	28
29	30	31				
SEPTEMBER						
Sun	Mon	Tues	Wed	Th	Fri	Sat
			1	2	3	4
5	6	7	8	9	10	11*
12	13	14	15	16	17*	18*
19*	20	21	22	23	24?	25*
26*	27**	28	29†	30*		
OCTOBER						
Sun	Mon	Tues	Wed	Th	Fri	Sat
					1†	2
3	4	5	6	7	8	9
10	11**	12	13	14	15	16
17	18*	19	20	21*	22	23*
24*	25*	26*	27	28	29	30*
31						
NOVEMBER-DECEMBER						
Sun	Mon	Tues	Wed	Th	Fri	Sat
	1*	2*	3***	4*	5*	6*†
7*†	8*†	9	10*†	11*†	12	13
14	15	16	17	18	19	20
21*	22	23	24	25	26	27
28	29	30	1***	2		

Fig. 3.—Calendar showing attacks of hyperinsulinism (* after date) † days on which alloxan was injected.

removed islet cell carcinoma with no evidence of neoplasm in the remaining pancreas; hence the metastases produced insulin. Over a period of several months attacks developed with progressive increase in frequency and severity, finally occurring at the rate of two to five a day. It was apparent that there was increasing difficulty in obtaining recovery from attacks by ingestion and injection of dextrose. The frequency and severity of attacks was definitely diminished following injection of alloxan. Periods of several days (as long as three weeks) occurred without attacks. Improvement in the situation occurred in the face of substantial curtailment of ingestion of food. Fasting blood sugar levels became elevated as compared with preinjection determinations. Finally, improvement followed injections with recurrence of attacks after a period, and subsequent improvement occurred after repetition of the injections. Studies on dogs revealed that whereas some islet cells were injured, resulting in a diabetic state, the majority were not destroyed or much affected and recovery ensued with return to normal blood sugar levels. It might

6. Gray, Lorne M.: Functioning Islet Cell Carcinoma with Metastases to Liver, *Am. J. Path.* 18: 633-641 (July) 1942.

CLINICAL EXPERIENCES WITH
DICUMAROL

REPORT OF EIGHTEEN CASES

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(MC) U.S.N.R.

The early favorable reports¹ on the use of the new synthetic orally administered anticoagulant dicumarol² have led me, during recent months, to a trial of the drug in 18 cases at the Lenox Hill Hospital. Opinions drawn from the use of any drug in such a small series are necessarily of limited value, but I feel that a report of the observations may be of some assistance in the evaluation of a drug which has variously been branded as useless or as excessively dangerous in effective dosage³ and, on the other hand, as of great value in the prevention of pulmonary embolism.⁴

SELECTION OF PATIENTS

Of the 18 patients treated, the largest group, 9, were suffering from clinically evident thrombophlebitis of the lower extremities. Five patients received prophylactic doses of dicumarol, following operation or delivery, because of a history of previous episodes of thrombosis or embolism. Two patients were treated subsequent to a postoperative pulmonary infarction. One patient was treated following a cavernous sinus thrombosis, and 1 was treated when cavernous sinus thrombosis seemed imminent. No patients with definite evidence of liver damage or with definite renal impairment were accepted for treatment because of the experimental evidence that such damage is a contraindication to the use of dicumarol.⁵

DOSAGE AND CONTROL

All patients were classified according to blood group prior to therapy, and all had daily determinations of the plasma prothrombin level (except on Sundays) performed in the hospital laboratory on undiluted plasma by the Quick method. In addition, hemoglobin determinations and red blood counts were performed every second day. Microscopic urinalyses were frequently performed in search for red cells, and physical examinations of the patients were performed daily, including arterial blood pressure determinations.

All adult patients received an initial dose of 300 mg. of dicumarol by mouth, and the following morning, regardless of the time of administration of the initial dose, an additional 200 mg. was given. Subsequent doses were given with the aim of maintaining the plasma prothrombin time level between 60 and 30 per cent of

normal in accordance with the experiences of Allen, Barker and Waugh.⁶ With this range in mind the usual follow-up doses were 200 mg., and administration of such doses depended both on the absolute level of the daily prothrombin determination and on the slope of the plotted curve of prothrombin values.⁷ The significance of the slope of the curve must be stressed, for the prothrombin time may be excessively and dangerously lengthened if a follow-up dose is given while the slope of the curve is upward (decreasing percentage of normal), and conversely the patient may escape from the desired range if one waits for the return of the prothrombin time to a specified level rather than administering the follow-up dose as soon as a definite swing to normal (4 per cent, or 5 seconds) is noted in the curve. No limit was set on the total amount of drug to be administered to any patient.

Despite the recognized fact⁸ that some persons are highly resistant to dicumarol (3 in our series) and others are remarkably susceptible (also 3 in our series) a program of dosage such as has been outlined permits maintenance of the majority of patients within the desired range of hypoprothrombinemia. It is necessary to administer follow-up doses of 300 mg. or more to patients recognized to be resistant, and reduction to

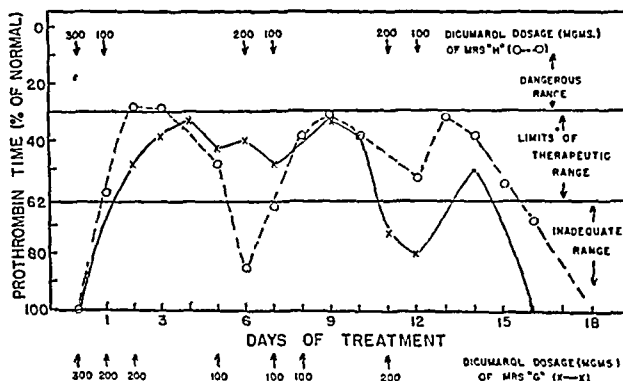


Chart 1.—Light broken line, prothrombin curve of Mrs. G. Note failure to heed 4 per cent drop in prothrombin time on tenth day with subsequent escape from therapeutic range. Heavy solid line, prothrombin curve of Mrs. H. (patient 1). Note slight overdosage on second day, escape on sixth day due to disregard of drop in curve, and proper method of dosage on eleventh and twelfth days. (See text.)

100 mg. is occasionally necessary in susceptible persons. Once therapeutic levels had been obtained, 7 of our last 10 patients treated according to the aforementioned principles were maintained at all times within the range of 62 to 30 per cent. Three cases were not entirely satisfactory, and of these 2 escaped above 62 per cent for one determination only, while the third escaped for a three day period. Chart 1 demonstrates the principles of dosage which have been discussed. In addition to dicumarol each patient received such drugs and treatments as were prescribed by the internist or surgeon in attendance. Thus sulfadiazine was given to 7 patients, and ice bags were applied intermittently over the affected region in the cases of thrombophlebitis. The patients with thrombophlebitis were given active foot exercises as soon as a therapeutic hypoprothrombinemia had been recorded.

From the various services of Lenox Hill Hospital.
Dr. Zucker was one time house physician and resident roentgenologist, Lenox Hill Hospital.

This study was carried out under the guidance and encouragement of Dr. Carl Eggers, attending surgeon. The cases were made available for study through the active cooperation of many members of the attending and house staffs, including particularly Dr. Mortimer W. Rodgers, associate attending gynecologist and obstetrician.

1. Bingham, J. B.; Meyer, O. O., and Pohle, F. J.: Studies on the Hemorrhagic Agent 3,3'-Methylene-Bis-(4-Hydroxycoumarin): I. Its Effect on the Prothrombin and Coagulation Time of the Blood of Dogs and Humans, *Am. J. M. Sc.* 202: 563-578, 1941. Meyer, O. O.; Bingham, J. B., and Axelrod, V. H.: Studies on the Hemorrhagic Agent 3,3'-Methylene-Bis-(4-Hydroxycoumarin): II. The Method of Administration and Dosage, *ibid.* 204: 11-21 1942. Allen, Barker and Waugh.⁶

2. The dicumarol used was made available in 100 mg capsules by the Abbott Research Laboratories, Chicago.

3. DeBakey, Michael: Dicoumarin and Prophylactic Anticoagulants in Intravascular Thrombosis, *Surgery* 13: 456-459, 1943. Davidson and McDonald.³

4. Barker, N. W.; Allen, E. W., and Waugh, J. M.: The Use of Dicumarol (3,3'-Methylene-Bis-[4-Hydroxycoumarin]) in the Prevention of Postoperative Thrombophlebitis and Pulmonary Embolism, *Proc. Staff Meet., Mayo Clin.* 18: 102-107, 1943.

5. Bollman, J. L., and Preston, F. W.: Effects of Experimental Administration of Dicoumarin: 3,3'-Methylene-Bis-(4-Hydroxycoumarin), *J. A. M. A.* 120: 1021-1024 (Nov. 28) 1942.

6. Allen, E. V.; Barker, N. W., and Waugh, J. M.: A Preparation from Spoiled Sweet Clover [3,3'-Methylene-Bis-(4-Hydroxycoumarin)] Which Prolongs Coagulation and Prothrombin Time of the Blood, *J. A. M. A.* 120: 1009-1015 (Nov. 28) 1942.

7. Since the prothrombin time in other laboratories is frequently reported in seconds rather than in percentage of normal, we have plotted the prothrombin time percentage from 100 per cent to 0 per cent rather than from 0 per cent to 100 per cent for clarity and comparability.

8. Conference on Therapy: Anticoagulant Drugs, New York State J. Med. 43: 860-867, 1943.

RESULTS OF TREATMENT

(a) *Thrombophlebitis*.—All of the 9 patients who received dicumarol while suffering from thrombophlebitis recovered. No suggestion of embolization was observed during the course of any of these cases; this observation is in no way remarkable, since embolization during the course of clinically recognized thrombophlebitis is infrequent. The recovery of 1 of these patients can in no way be related to dicumarol therapy, since no adequate prolongation of the prothrombin time was achieved (below 62 per cent for only two days).

The average duration of dicumarol therapy in these cases was fourteen days, and the longest treatment lasted sixteen days (exception is case 1). Hospitalization, as a rule, was continued for a few days after the prothrombin time had been permitted to return to normal. It is my opinion that the duration of the illness in these cases, many of which were severe, was shorter than would have been expected without the use of dicumarol.

In the entire group there was no evidence of central extension of the thrombus once an adequate prothrombin time had been reached, although in several cases peripheral extension continued for several days.

Disappearance of pain in the affected area or pronounced diminution was observed in 7 of the cases at the time when the desired level of hypoprothrombinemia had been reached. This pain diminution persisted in contrast to the analgesic effect of ice packs, which usually lasted only a few minutes after the pack was removed and which often was unsatisfactory over long periods of time. In 1 case in which the prothrombin time escaped to normal levels the pain recurred coincident with the escape and disappeared again as control was reestablished. In another case there was a delay in establishing hypoprothrombinemia because of resistance to the drug, and the pain disappeared only when the dicumarol was finally effective in lengthening the prothrombin time.

One case of interest is presented:

CASE 1.—Mrs. H., aged 59, a housewife, was admitted on March 29, 1943 for pain, swelling and redness of the right lower extremity. There was a history of right sided thrombophlebitis one and one-half years previously, and the patient had bilateral varicose veins of long standing. Oscillometric readings showed poor arterial circulation in both lower extremities. There was an increase in signs and symptoms despite bed rest, ice packs and elevation. On April 7 dicumarol therapy was instituted and the pain and tenderness in the right thigh rapidly disappeared, although the edema persisted for two weeks. The prothrombin time was permitted to return to normal after nineteen days of treatment (April 25) and the patient was allowed up.

On May 1, six days after treatment had been discontinued, the patient complained of heaviness and pain in the left popliteal region, and an abnormal cordlike structure could be felt there. The next day tenderness in the femoral region was also encountered. Dicumarol therapy was reinstated on May 1, and a satisfactory prothrombin level was reached on May 3. The pain and tenderness rapidly disappeared and no further extension of the process was noted. On May 11 the prothrombin time was permitted to return to normal range and the patient was permitted to hang her feet out of bed on May 12 and to get up on May 15.

There was some elevation of temperature on May 16, five days after dicumarol therapy had been discontinued, and the patient began to complain of pain in the left thigh. On May 21 a firm pencil-like mass was palpable in the left thigh on its medial aspect. Dicumarol was once again started on May 24, and a therapeutic level had been reached on May 25. The

patient was now "fairly comfortable," according to the nurse's notes. She experienced a little pain the following day but then remained entirely comfortable until June 1, when she complained of a brief spasm of pain. On June 7 she complained of pain most of the day, and it was found that for the first time she had escaped from a therapeutic range of hypoprothrombinemia. Within thirty-six hours a satisfactory level had been restored and the pain had disappeared. Improvement has been progressive since and the patient (June 20) is up and about, still on dicumarol.

The sequence of events in this case is strong evidence that dicumarol may favorably modify the course of thrombophlebitis. Coincidence would seem an inadequate explanation for the relationship of dicumarol therapy to this series of remissions and relapses.

(b) *Prophylaxis*.—Five patients were given postoperative courses of dicumarol; of these 2 had undergone general surgical procedures, 2 had been delivered by cesarean section and 1 had undergone sterilization and therapeutic curettage. Four of these patients had a history of one or more antecedent episodes of thrombosis, and 1 of these had had a pulmonary infarct. All the patients in this group had uncomplicated postoperative courses. The longest postoperative hospitalization was fifteen days.

A representative case from this group is presented:

CASE 2.—Mrs. M. M. was admitted in the third month of her first pregnancy. Four years previously she had an extensive thrombophlebitis of the left leg, which was first noted on the twelfth day after appendectomy; she was hospitalized for seventeen days thereafter and has since been subject to swelling of the left leg. One sister died of a pulmonary embolus secondary to a postpartum thrombophlebitis, and a second sister underwent amputation of her left lower extremity when a thrombosis developed after childbirth.

On May 23 sterilization and therapeutic curettage were performed and on May 26 a prophylactic course of dicumarol was started. The prothrombin time was maintained within the therapeutic range until the patient was discharged well on her eleventh postoperative day.

(c) *Pulmonary Embolism*.—Two patients who suffered postoperative emboli were given courses of dicumarol in the hope of inhibiting further thrombosis and embolization. Neither patient had any evidence of further embolic phenomena and both had uncomplicated recoveries. One of these patients had a thrombophlebitis of the superficial veins of her left thigh, and the local pain of which she complained disappeared at about the time that her prothrombin time reached the desired range. The other case is reported in greater detail:

CASE 3.—Mrs. S. S., aged 42, a housewife, entered the hospital the second time for vaginal bleeding secondary to adenomyosis uteri. Preoperative examination of the lower extremities was negative. An uneventful supracervical hysterectomy was performed on March 2, 1943. On March 5 the patient experienced sudden right chest pain, accentuated on inspiration and accompanied by small amounts of blood flecked sputum. The chest pain continued for several days, and a friction rub was heard on three occasions. Physical examination on March 8 revealed slight but definite tenderness on the lateral aspect of the left calf, and dicumarol was started. An effective hypoprothrombinemia was maintained from March 9 to March 15, but despite the anticoagulant therapy a superficial thrombophlebitis developed in the right antecubital fossa secondary to a venipuncture, and this process spread several centimeters centrally and peripherally during the following two days. The tenderness in the left calf rapidly disappeared, but the antecubital region remained tender and painful for several days. The remainder of the patient's course was uncomplicated and she was discharged well on April 4, 1943.

(d) Cavernous Sinus Thrombosis.—

CASE 4.—W. L., a man, was admitted on May 25 for massive nasal and facial swelling associated with right orbital cellulitis and proptosis, and with thrombosis of the right retinal veins. Blood culture was positive for *Staphylococcus aureus*, and sulfadiazine was immediately started. The patient's clinical course was downhill, and all observers agreed that he had a right cavernous sinus thrombosis. Dicumarol therapy was instituted and on May 30 an effective level was reached; on that day, for the first time, the patient seemed somewhat improved. He improved rapidly for several days and gradually thereafter; the temperature began to subside on May 30. A therapeutic hypoprothrombinemia was maintained until June 16, and the patient was discharged on June 17 well except for right amblyopia. This course is presented in chart 2.

CASE 5.—J. C., a boy aged 12 years, treated for imminent cavernous sinus thrombosis, was admitted for massive facial swelling and tenderness secondary to pericementitis of a left upper central incisor. There was localized tenderness over the lateral (left) nasal vein. Sulfadiazine was started, and on May 12 the affected tooth was removed; postoperatively dicumarol therapy was begun. No improvement was noted during the following day, but that night (May 13) the desired

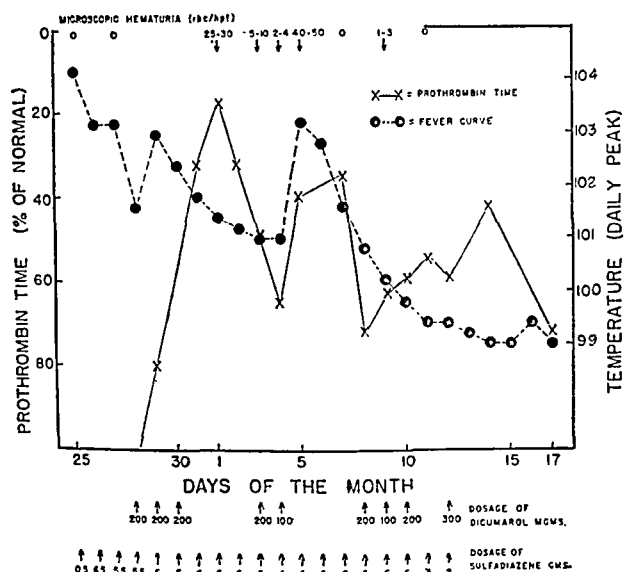


Chart 2 (case 4).—Light solid line, prothrombin time. Broken line with black dots, fever curve.

hypoprothrombinemia was achieved and on the following morning improvement in the facial swelling and tenderness was noted, which continued until the patient was discharged much improved on May 22.

The pain pattern is worth noting; on May 12 the notes state that the patient was "crying, irritable" and the same note is made the following morning; that afternoon he was "crying, depressed," but that night he "seemed more contented" and thereafter each note stated that he was comfortable. Again relief from pain and satisfactory hypoprothrombinemia correlate.

TOXICITY

One of our 18 patients developed a petechial rash on the fifth day of treatment, at which time his prothrombin time had dropped to 18 per cent of normal (considerably lower than our desired range of 30 to 62 per cent). The petechiae were distributed over both shoulders and both flanks. No conjunctival, sublingual or retinal hemorrhages were present, but a Rumpel-Leede test was moderately positive. On the same day 25 to 30 red blood corpuscles per high power field were observed in a centrifuged urine specimen. The rash

disappeared over a period of about four days, while the Rumpel-Leede test became negative after three days. Microscopic hematuria continued for eight days, reaching its maximum of 40 to 50 red blood corpuscles per high power field on the fourth day of the episode. The patient had an otherwise uneventful recovery; a more detailed discussion is presented in the report of case 4. Chart 2 shows the prothrombin curve in this case.

None of the remaining patients showed any evidences of macroscopic hemorrhage, although 3 of them had prothrombin times of 22 per cent or less on one or more occasions. It should be noted that this included 11 post-operative patients, none of whom developed hematomas, and 4 postpartum patients, none of whom bled or had abnormal lochia.

Microscopic hematuria was found in 4 cases other than the 1 reported. The prothrombin time was 30 per cent of normal or less in 3 of these at the time when the red cells appeared. In each case the urine quickly cleared. We have excluded from this group 10 patients who showed microscopic hematuria following operations in the genitourinary regions but have included a patient whose urine cleared following supracervical hysterectomy and subsequently showed red cells (thirteenth postoperative day).

Three patients have complained of nausea following a dose of dicumarol. The drug was continued in each case, and in none did the nausea recur. Despite a careful search, no other possible evidences of dicumarol toxicity were found; there was no suspicion of liver damage and no evidence of embolization. The danger of hemorrhage following venipuncture has been mentioned by others;⁸ I have seen no instances of this complication, although the only precaution has been the use of a fine (23 or 24 gage) needle.

COMMENT

Dicumarol has been criticized from the point of view of difficulty of control.⁹ My experience confirms the difficulty of ideal control, but I feel that the majority of patients can be maintained within desired prothrombin time limits if the frequency and size of follow-up doses is modified according to the slope of the prothrombin curve and the response to the initial three doses, as well as according to the absolute level. With such a program the few patients who escape from control will be suffering from underdosage rather than overdosage, and toxic manifestations (hemorrhage) will be unlikely.

Critics have stressed the danger of hemorrhage with dicumarol therapy¹⁰ and have suggested the possibility of other toxicity.⁹ To date no clinical or experimental evidence in the literature has shown toxicity other than hemorrhage; my experiences are in agreement with this fact. In this small series no hematomas or hemorrhages were observed; 1 patient had a mild transient purpura, and 4 other patients showed transient microscopic hematuria. I feel that chance may in part account for the absence of hemorrhage in this series but suggest that the method of dosage may be in part responsible. The lack of significant toxicity under proper control is in agreement with the impression of Wright^{10a} that dicumarol may be safer for general use than heparin.

9. Davidson, C. S., and McDonald, H.: A Critical Study of the Action of 3,3'-Methylene-Bis-(4-Hydroxycoumarin) (Dicoumarin), *Am. J. M. Sc.* 205: 24-33, 1943.

10. Cahan, A.: Hemorrhage and Purpura Caused by Dicoumarin, *New England J. Med.* 228: 820-822, 1943. DeBakey, Conference on Therapy.

10a. Wright, I. S.: Thrombosis: Modern Concepts of Cardiovascular Disease, published by American Heart Association 12, No. 4, 1943.

The results of treatment with dicumarol, as with any new drug, are difficult to assay. I was impressed with the rapid recovery and short convalescence of 8 of the patients treated for thrombophlebitis; dicumarol may well have expedited their recovery. In addition, the disappearance of pain in 7 of these patients and in 2 from other groups seemed to parallel the achievement of therapeutic levels of hypoprothrombinemia. I have found no other mention of this phenomenon in the literature. If the disappearance of pain in thrombophlebitis were due to hypoprothrombinemia, one might postulate that the pain was secondary to the venospasm resulting from the propagation of a thrombus; when the propagation has been stopped the pain disappears.

The prophylactic results, the results in cavernous sinus thrombosis and in threatened cavernous sinus thrombosis and the results in 2 cases of pulmonary embolism are interesting, but no further comment seems justified in such a small series. The excellent results reported from the Mayo Clinic⁴ are of particular importance in the last regard.

Of considerable theoretical interest was the development of thrombophlebitis in 1 of the patients while under adequate dicumarol therapy (patient 3). This raises the question as to whether dicumarol hypoprothrombinemia of the magnitude produced in this series is sufficient to inhibit intravascular clotting. Although the experiments of Bollman and Preston,⁵ Dale and Jaques¹¹ and Richards and Cortell¹² demonstrate inhibition of clotting in the presence of dicumarol hypoprothrombinemia, these experimental results do not seem comparable to human conditions because of the severity of the hypoprothrombinemia induced in most experiments and because of the relatively drastic alterations in the condition of the vessel walls. Davidson and McDonald⁹ felt that massive and dangerous dosage was necessary to produce adequate changes in coagulability, but in my opinion their experiences with the coagulation time in lusteroid tubes does not necessarily lead to this conclusion. In any event the available experimental evidence is inadequate to determine whether dicumarol, in the stated range, is able to prevent thrombosis in human veins under conditions of stasis and clot propagation. I believe that dicumarol is effective and that the development of thrombophlebitis in the case under discussion illustrates a safety factor in its use. It is hypothesized that hypoprothrombinemia in the 60 to 30 per cent range is sufficient to inhibit purely venostatic coagulation, whereas coagulation of the hemostatic type associated with the local accumulation of thrombokinase may occur.

CONCLUSIONS AND SUMMARY

1. Dicumarol was administered orally to 18 patients with various indications. All the patients had uncomplicated recoveries; this includes 1 case of cavernous sinus thrombosis.

2. One patient had a transient purpura, and 4 other patients had transient microscopic hematuria. No other evidences of hemorrhage were observed although 11 postoperative and 4 postpartum patients were treated. No evidence of toxicity other than hemorrhage was observed.

3. Control of the prothrombin level during dicumarol therapy is not easy, but the method of dosage which

I have used has proved generally effective and invariably safe in a small series.

4. Dicumarol seems to have a beneficial effect in cases of thrombosis and embolism. No more definite statement can be made until many more cases have been reported. In this series the disappearance of pain and the achievement of hypoprothrombinemia showed a striking relationship.

5. Dicumarol cannot, in my opinion, replace heparin in emergencies demanding anticoagulant therapy, nor should it be used as an alternative to indicated surgical procedures.

6. The cheapness of dicumarol, its ease of administration, its apparent margin of safety and its possible efficacy in thrombotic diseases warrant further controlled clinical trials of the drug. I feel that the ultimate field of usefulness of dicumarol will principally be in the prophylaxis of thrombosis and embolism and in the treatment of thrombophlebitis.

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INTRAMUSCULAR ADMINISTRATION OF ANTI-HAEMOPHILUS INFLUENZAE. TYPE B, RABBIT SERUM

A REPORT OF ITS USE IN THREE CASES OF
INFLUENZAL MENINGITIS

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The development by Alexander¹ of a therapeutic type-specific rabbit serum has dramatically influenced the prognosis in infections by *Haemophilus influenzae*, type b. In our own series of cases of meningitis by this organism, the mortality was 100 per cent (11 out of 11 cases) prior to the use of rabbit serum, and 15 per cent (4 out of 26 cases) with its use in conjunction with sulfonamide compounds. In the past we have administered the serum intravenously or both intravenously and intrathecally as recommended by Alexander.² Recently 3 babies with meningitis due to *H. influenzae*, type b, were admitted to the pediatric isolation wards of the New Haven Hospital and afforded an opportunity for the determination of the effectiveness of the serum when administered intramuscularly.

REPORT OF CASES

CASE 1.—G. K., a boy aged 18 months, was admitted with a history of a "cold" with nasal discharge for one week. During the day before admission he seemed drowsy and in the evening vomited twice. The following morning his temperature was 104 F. By noon the temperature had risen to 106 F. and the family physician noted that the baby's neck was stiff. Hospitalization was advised.

Aided by a grant from the Fluid Research Fund of the Yale University School of Medicine.

From the Department of Pediatrics, Yale University School of Medicine, and the Children's Clinic of the New Haven Hospital.

1. Alexander, Hattie E.: Type B Anti-Influenzal Rabbit Serum for Therapeutic Purposes, *Proc. Soc. Exper. Biol. & Med.* **40**: 313-314 (Feb.) 1939.

2. Alexander, Hattie E.: Treatment of Bacterial Meningitis, *Bull. New York Acad. Med.* **17**: 100-115 (Feb.) 1941; Treatment of Influenzal

Connecticut M. J. **6**: 167-173 (March) 1942. Alexander, Catherine, and Leidy, Grace: Treatment of Type B Influenzae Infections in Infancy and Childhood, *J. Pediatr.* **20**: 98 (June) 1942. Alexander, Hattie E.: Experimental Basis for Treatment of *Haemophilus Influenzae* Infections, *Am. J. Dis. Child.* **66**: 160-171 (Aug.) 1943.

11. Dale, D. U., and Jaques, L. B.: The Prevention of Experimental Thrombosis by Dicumarin, *Canad. M. A. J.* **46**: 546-548, 1942.
12. Richards, R. K., and Cortell, R.: Studies on the Anticoagulant 3,3'-Methylene-Bis-(4-Hydroxycoumarin), *Proc. Soc. Exper. Biol. & Med.* **50**: 237-242, 1942.

On admission to the New Haven Hospital the patient's temperature was 104.8 F.; he was pale, acutely ill, irritable and restless but clear mentally. There was a moderate amount of nasal discharge, and the throat was injected. Both membranae tympani were dull and inflamed. The neck was stiff. Lumbar puncture revealed an initial spinal fluid pressure of 350 mm.

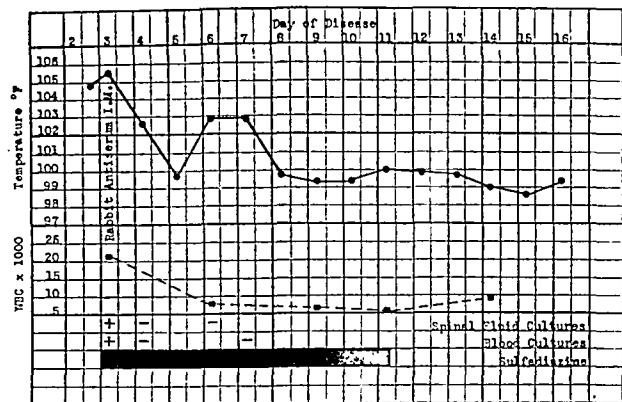


Chart 1 (case 1).—H. Influenzae, type b, meningitis and bacteremia.

The fluid was cloudy and contained 5,200 white blood cells per cubic millimeter, of which 98 per cent were polymorphonuclear leukocytes. Stained smear showed numerous gram-negative, pleomorphic bacilli which were identified by the Neufeld technic of capsular swelling as type b influenzal organisms. Sulfadiazine was administered by mouth in a dosage of $1\frac{1}{2}$ grains (0.1 Gm.) per pound of body weight daily. The contents of three vials of anti-H. influenzae type b rabbit serum, totaling 75 mg. of antibody nitrogen, were injected intramuscularly after negative ophthalmic and cutaneous tests for sensitivity. The baby's temperature returned to normal by the fourth day of hospitalization. On the fifth hospital day his temperature rose to 102.9 F. An excess of free antibody was present, as demonstrated by capsular swelling of the infecting strain of type b influenzal bacillus by the patient's blood serum in a 1:10 dilution. This indicated that an adequate amount of serum had been injected. Fever persisted and a right myringotomy was performed on the following day, although there was no local evidence that an otitis media of a purulent nature was present. Pus was not obtained, and a culture of the auditory canal was

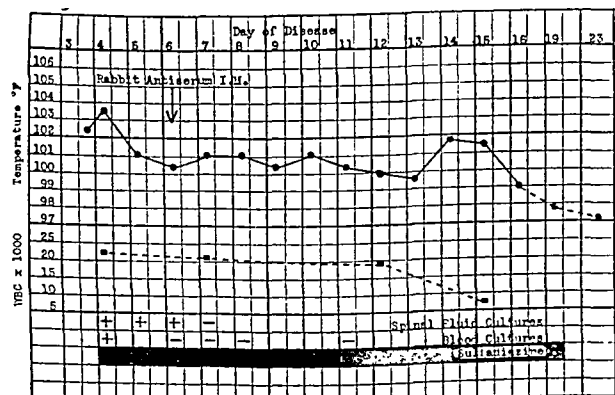


Chart 2 (case 2).—H. Influenzae, type b, meningitis and bacteremia.

negative for the type b influenzal bacillus. The baby's temperature dropped rapidly to normal and convalescence was uncomplicated.

Admission nasal, pharyngeal, spinal fluid and blood cultures were positive for H. influenzae, type b. The spinal fluid sugar prior to treatment was 68 mg. per hundred cubic centimeters. The white blood cell count was 20,500, of which 87 per cent were polymorphonuclear leukocytes. Blood sulfadiazine levels ranged from 9 to 12.9 mg. per hundred cubic centimeters.

An excess of free antibody was demonstrated in the patient's blood eight hours after the injection of rabbit serum and persisted for a period of at least four days as determined by daily tests.

CASE 2.—B. F., a boy aged 20 months, was admitted to the New Haven Hospital with a history of fever up to 105 F. for three days. There were no other signs except anorexia. On the morning of admission he vomited once and appeared drowsy. He was brought to the hospital in the late evening after the occurrence of a generalized convulsion.

The patient's temperature was 102.4 F., the lips were cyanotic and the skin was mottled. Follicular tonsillitis was present. There were occasional convulsive movements of the extremities, and the neck was stiff. Lumbar puncture revealed an initial spinal fluid pressure of 350 mm. The fluid was cloudy and contained 19,000 white blood cells per cubic millimeter, of which 95 per cent were polymorphonuclear leukocytes. Stained smear showed numerous gram-negative pleomorphic bacilli, which were identified as type b influenzal bacilli. Sodium sulfadiazine was administered by infusion and clysis and on the third hospital day was replaced by sulfadiazine orally. The baby's temperature fell to a lower level, but he remained severely ill and influenza bacilli persisted in the spinal fluid. Anti-H. influenzae, type b, rabbit serum containing 75 mg. of antibody nitrogen was injected intramuscularly on the fourth hospital day after ophthalmic and cutaneous tests for sensitivity were found to be

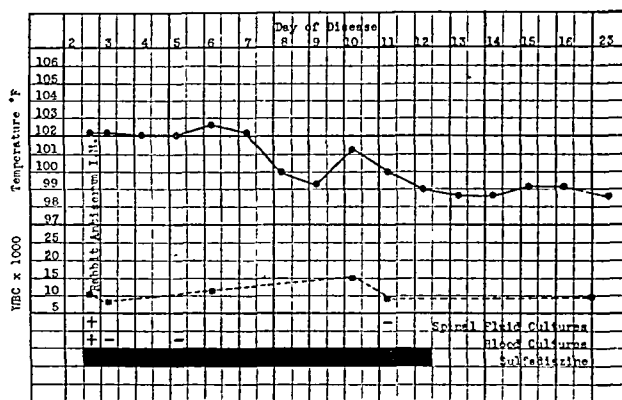


Chart 3 (case 3).—H. influenzae, type b, meningitis and bacteremia.

negative. Fever persisted for the first thirteen days of hospitalization, but there were no complications.

Admission nasal, pharyngeal, spinal fluid and blood cultures were positive for H. influenzae, type b. The spinal fluid sugar before treatment was 33 mg. per hundred cubic centimeters. The white blood cell count was 22,800, of which 87 per cent were polymorphonuclear leukocytes. Blood sulfadiazine levels varied from 12 to 23.6 mg. per hundred cubic centimeters.

An excess of free antibody was demonstrated in the baby's blood twelve hours after the injection of rabbit serum and persisted for a period of at least six days.

CASE 3.—D. M., a boy aged 14 months, was admitted to the New Haven Hospital with a history of fever, anorexia and vomiting beginning on the preceding day. During the night he was restless. On the morning of admission he was examined by the family physician, who noted stiffness of the baby's neck and advised hospitalization. There was a history of a "cold" three weeks previously, which lasted for about ten days.

The patient's temperature was 102.2 F. He appeared acutely ill and was moderately dehydrated. The neck and back were rigid. There were no signs of an upper respiratory infection. Lumbar puncture yielded cloudy spinal fluid, which contained 13,700 white blood cells, all polymorphonuclear leukocytes, and numerous type b influenzal bacilli. One infusion of sodium sulfadiazine was administered; subsequent chemotherapy consisted of sulfadiazine orally. Anti-H. influenzae, type b, rabbit serum containing 75 mg. of antibody nitrogen was injected intramuscularly after sensitivity tests were found to be negative.

The baby's temperature dropped toward normal on the seventh hospital day, and convalescence was uncomplicated except for a transient fever on the ninth day.

Admission nasal, spinal fluid and blood cultures were positive for *H. influenzae*, type b. The spinal fluid sugar before treatment was 16 mg. per hundred cubic centimeters. The white blood cell count was 10,450, of which 69 per cent were polymorphonuclear leukocytes. Blood sulfadiazine levels varied from 4.5 to 13.1 mg. per hundred cubic centimeters.

An excess of free antibody was demonstrated in the patient's blood one hour after the injection of rabbit serum and persisted for a period of at least eight days.

SUMMARY AND CONCLUSIONS

Anti-*H. influenzae*, type b, rabbit serum was administered intramuscularly to 3 babies with meningitis and bacteremia. Chemotherapy consisted of sulfadiazine. An excess of free antibody was demonstrated in the blood of two patients eight and twelve hours respectively after intramuscular administration of the therapeutic serum and was known to persist for a period of four and six days respectively. The exact time of appearance and disappearance of free antibody is not known, since earlier and subsequent tests for its presence were not made. With the third patient, an excess of free antibody was demonstrated in the blood as early as one hour after intramuscular injection of the serum and persisted for at least eight days. Antibody was not present prior to the administration of serum. The 3 babies recovered without sequelae.

We felt justified in administering the serum intramuscularly rather than intravenously, since the first baby was treated early in the disease and was not operately ill. The satisfactory course of this patient to the subsequent use of serum intramuscularly.

The therapeutic serum appears to be effective when administered intramuscularly. Under certain circumstances the technical advantages of intramuscular over intravenous injection of the serum may be significant.³

3. Since this report was written, 2 additional babies have been treated with serum intramuscularly. One, aged 10 months, with laryngitis and bacteremia, recovered without complications; the other, aged 3 months, with meningitis and bacteremia, died. An excess of free antibody was present in the blood five hours and one hour respectively after the administration of serum and was known to persist for nine and sixteen days respectively.

Pericardial Pain.—Exploration of the pericardial sac presented many difficulties. Only patients with a large pericardial effusion were suitable for this method of investigation. After outlining the sac by x-ray, the trocar was inserted first through the intercostal space, then through the pericardial sac, noting the presence or absence of pain during the procedure. Once within the sac, the silver wire was introduced and the point brought in contact with the serous surface of the pericardium by scratching and by pressure. The following observations were noted in these experiments: 1. Paracentesis of the pericardium at the level of the fifth and sixth interspace near the mammary line elicited pain in the neck, sharp and restricted to a point over the trapezius ridge. Penetration of the pericardium at high levels failed to produce pain. This pain was similar to that previously described from irritation of the central portion of the diaphragmatic pleura. So we are entitled to assume that the phrenic nerve endings are reflected over the lower portion of the fibrous pericardium. 2. Scratching or pressure of the wire on the heart itself produced no pain, although a peculiar feeling of distress and apprehension was induced by "tripping" the apex with the wire. 3. The inner surface or serous layer of the pericardium gave no pain response to irritation.—Capps, Joseph A.: *Pain from the Pleura and Pericardium*, Research Publications, Association for Research in Nervous and Mental Disease, Baltimore, Williams & Wilkins Company, 1943.

DERMATITIS CAUSED BY VARIOUS REPRESENTATIVES OF THE ANACARDIACEAE

IN TROPICAL COUNTRIES

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Two short papers that appeared in *THE JOURNAL* Sept. 4, 1943 inspired me to prepare this paper. One of these was entitled "Dhobie Mark Dermatitis" and the other "Dermatitis from *Semecarpus Anacardium*."¹ In the first paper, 52 cases were reported in which dermatitis resulted among American soldiers serving in India; articles of clothing worn by them had been marked with the juice of the marking nut, *Semecarpus anacardium*. In the second paper there was a report of 16 persons who were affected out of 50 who were exposed in sorting mail in Washington, D. C., that had been contaminated by a partly opened bottle of bhilawanol oil (marking nut oil) that happened to be included in the same sack of mail. In practice in India the oil of the marking nut, mixed with lime water or alum, is used by the native laundrymen as a marking ink for articles of clothing; it is insoluble in water and hence distinctly permanent. The somewhat caustic juice from the fruit walls of the common and widely known cashew nut (*Anacardium occidentale*) is similarly used. In the case of the latter species, when cooking the nuts by boiling or by roasting, one is warned not to stand where the steam or the smoke will come in contact with one's person. It is a well known fact that persons susceptible to *Rhus* dermatitis are frequently poisoned by merely standing in the smoke of bonfires in which parts of poison oak or poison ivy plants are being burned, and this applies also to the steam or smoke when cashew nuts are boiled or roasted.

My object in this paper is to record the fact for the benefit of medical men assigned to positions in the Old World tropics that in most parts of the region certain plant species do occur that, on contact, cause a distinct and often severe dermatitis corresponding exactly to *Rhus* dermatitis in the United States. All these deleterious species belong in the same natural family as do our poisonous species of *Rhus* (poison oak, poison ivy, poison sumac), the Anacardiaceae, and the active principle is the same in all cases. It is evident that as the war progresses there will be cases of dermatitis observed in the active and potentially active areas. It is scarcely necessary to prepare a botanical treatment of this subject, for one simply cannot educate all members of the armed services called on to operate in the forests and jungles to recognize at sight the relatively few poisonous plant species that may be encountered. After all, in practice it will be found that cases of dermatitis will occur chiefly among those men who fell certain types of trees and who inadvertently smear themselves more or less with an

1. Livingood, C. S.; Rogers, A. M., and Fitz-Hugh, Thomas, Jr.: Dhobie Mark Dermatitis, *J. A. M. A.* **123**: 23-26 (Sept. 4) 1943. Fitz-Hugh, Thomas, Jr.; Livingood, C. S., and Rogers, A. M.: Dhobie Mark Dermatitis, *Bull. U. S. Army M. Dept.*, 1943, number 69, pp. 55-58. Goldsmith, N. R.: Dermatitis from *Semecarpus Anacardium* (Bhilawanol or Marking Nut) Spread by Contaminated Mail, *J. A. M. A.* **123**: 27 (Sept. 4) 1943. Waud, S. P., and Fein, H.: Dermatitis Venenata Caused by the Ink from the Bichi Nut, *Bull. U. S. Army M. Dept.*, 1943, number 69, pp. 59-60.

innocent looking sap of these trees. The point that needs repetition is that the average physician working with our troops may expect, on occasion, to encounter mild to rather severe cases of dermatitis caused by the victims coming in contact with certain trees or shrubs, and in such cases the indicated treatment is exactly the same as that used for ordinary *Rhus* dermatitis at home.

The Anacardiaceae are a family of woody plants of worldwide distribution, chiefly trees, but including some shrubs and vines. It is rather a striking fact that frequently species of this family that are contact poisons produce fruits that at maturity may be eaten with entire safety. Actually in the Old World tropics certain definitely poisonous species of *Mangifera* (mango) are widely cultivated for their edible fruits. The genera involved are *Rhus*, including its segregate *Toxicodendron*, with perhaps 200 species, fortunately few of them actually poisonous (those in the *Toxicodendron* group only), and confined to certain parts of North America, Japan and China, *Anacardium* with fifteen species, tropical America, one (*Anacardium occidentale*), the common cashew nut, introduced and abundant in the Old World tropics, *Gluta*, fifteen species, *Swintonia*, sixteen species, *Melanorrhoea*, eighteen species, *Melanochyla*, thirteen species, *Semecarpus*, ninety species, *Camposperma*, twelve species, and *Mangifera*, sixty species, all these genera characteristic of the Indo-Malaysian region; and *Metopium*, two species, *Comocladia*, thirty-five species, *Lithraea*, six species and *Pseudosmodium*, four species, all characteristic of tropical America. They are found chiefly in forested areas, but some grow in thickets and in fence rows. Many of them are fortunately by no means common, and, generally speaking, it is only a few species of any particular genus, such as *Mangifera*, *Semecarpus* and *Rhus*, that are actually poisonous.

There is, of course, a great variation in susceptibility in different persons, some being highly allergic, others being relatively immune to the poisonous principle. Curiously, the mature fruits of even the poisonous species of *Mangifera*, *Semecarpus* and *Anacardium* may be eaten with impunity, while the seeds of *Gluta* may be eaten with entire safety after cooking. In this family are a considerable number of genera which contain species widely cultivated for their edible fruits in various tropical countries, including representatives of *Spondias*, *Dracontomelon*, *Pleiogynium*, *Odina*, *Pistacia*, *Cyrtocarpa*, *Lansea* and *Harphyllum*. None of these are contact poisons.

These contact poison plants belonging in often very dissimilar genera are so well known to the natives familiar with the forest that in British Malaya, for example, the various species of such strikingly dissimilar genera as *Gluta*, *Melanochyla*, *Melanorrhoea*, *Semecarpus* and *Swintonia* are collectively known as *rengas*, cognate forms of this word in Java being *ingas* and in the Philippines (for *Semecarpus* species) *ligas*.

In general the various representatives of the Anacardiaceae have a more or less resinous sap which is sometimes slightly milky and which on exposure to the air soon becomes brown or black. The sap of some species of *Rhus*, *Gluta* and *Melanorrhoea* is the basis of certain types of lacquer widely utilized in the Old World. It is reported that workers in the lacquer industry develop a very high degree of immunity to what may be designated as anacardiaceous dermatitis. It is this sap that carries the poisonous properties of the various

species, and it occurs, of course, in greater or less abundance in all parts of the plant. This sap is never irritating on contact, the characteristic dermatitis not developing for some time after a person has come in contact with the plant or its juice. Yet such is the variation in immunity that highly allergic persons coming in contact even with old lacquered furniture may on occasion develop the dermatitis characteristic of *Rhus* poisoning. In the case of the common mango, while most persons can safely eat this magnificent fruit in quantity, occasionally persons will be found who will at once develop a characteristic mango rash on eating even a small amount of the fruit.

Instances have been reported of persons developing a characteristic dermatitis after having stood under some of these tree species during showers, and others by their merely coming in contact with the fresh leaves. Generally, however, dermatitis occurs only when one comes in contact with the plant sap, either fresh or old. Some of the species actually yield important commercial timbers, but difficulties are often encountered by persons handling the lumber, often long after the trees may have been felled. This for the reason that the sap may retain its highly irritant qualities for a long time, quite as in the case of the marking nut, when dermatitis occurred even after clothing marked with its oil had been laundered. In 1 case reported to me in Manila from Boston many years ago a carpenter working with imported lumber developed a very severe dermatitis and an examination of the wood showed that it was the Malayan *rengas* (*Gluta*), logs of which are sometimes exported, for it is a good cabinet timber.

The famous tropical fruit the mango (*Mangifera indica*) is normally innocuous, but this cannot be said regarding certain wild species of *Mangifera* characteristic of the Indo-Malaysian region, some of which are also cultivated about houses and in orchards for their edible fruit. With representatives of this genus it is the sap that should be avoided, one author intimately familiar with the vegetation of the Malay Peninsula stating "Our advice is always to treat respectfully Mango-like trees which smell of turpentine." The *binjai* or *uani* (*Mangifera caesia*), the *lanjut* (*Mangifera lagenifera*), the *bachang* (*Mangifera foetida*) and *kwin* (*Mangifera odorata*) are all contact poisons, yet in the Malayan region all are cultivated for their edible fruits. Of these the *lanjut* and the *binjai* are the most poisonous; even the vapor from freshly bruised tissues, the smoke from a bonfire of their leaves and branchlets, or raindrops falling through the crown of the tree may affect the skin. All the *Mangifera* species are large trees, and most of the species, other than the few cultivated ones, occur only in forested regions as widely scattered individuals. They are mostly Malayan, some extending northward to Burma, Siam and Indo-China.

The generally accepted idea is that the poisonous principle characteristic of certain genera and species of the Anacardiaceae is a very permanent nonvolatile oil, which on contact with the skin causes the characteristic dermatitis familiar to all physicians who have had occasion to treat cases of *Rhus* poisoning. It may safely be assumed that the poisonous principle, whatever it is, is the same for all representatives of the various genera listed, and in cases of dermatitis simulating that caused by our common poison ivy and poison oak or poison sumac, the indicated treatment is exactly that which the physician would use in any part of the United States for *Rhus* dermatitis. One can

scarcely escape the conclusion, from what has already been reported, that American troops serving in almost any part of the Indo-Malaysian region may come in contact with some of these poisonous species, and the probability is that physicians serving with the troops will have, on occasion, to treat cases of more or less severe dermatitis which will remind him of Rhus dermatitis with which he is familiar at home.

While there are plants in the tropics in other families than the Anacardiaceae that may cause dermatitis, I know of none in which the active principle is the same as that characteristic of the Anacardiaceae. Certain species of the Euphorbiaceae, with milky sap, may and do cause severe dermatitis, but this is caused by contact with the milky juice with which the growing parts of these plants are charged, an excellent example being the tropical American manchineel (*Hippomane mancinella*). In other representatives of this family difficulties may be encountered only when the milky sap comes in contact with mucous membranes, such as those about the eye; some of these euphorbiaceous plants are even reputed to cause such severe conjunctivitis that blindness may follow.

Aside from these contact poisons there is little to fear in the tropical jungles. Certain species of *Jatropha* in tropical America and representatives of a few other genera have intensely irritating stinging hairs, and this is also true of the numerous Old World species of the tree nettle (*Laportea*), shrubs and small trees, first cousins to the common nettle but much more vicious.

Contact with these shrubs or small trees causes an immediate sensation similar to that which one feels on touching red hot iron, and this intense pain is almost immediately followed by extensive water blisters, which continue to form for some time following exposure. The irritating principle in the case of the tree nettles is apparently formic acid, and the indicated treatment is to bathe the affected parts thoroughly with an alkaline solution.

Purely mechanical are the stinging hairs found on the pods and certain floral parts of the cowhage (*Mucuna*), and representatives of this genus occur in both hemispheres. Apparently in the case of the cowhage the resulting pain is due wholly to the mechanical effect of the very stiff, needle shaped stinging hairs. In India, and perhaps in other parts of the world as well, these stinging cowhage hairs, mixed with molasses as a carrier, are used as a remedy for tapeworm, the mixture being swallowed, the soft tissues of the tapeworm attracting the stinging hairs with apparently fatal affect to the tapeworm.

As with Rhus, contact with the poisonous plants briefly discussed will yield varying results. Highly allergic persons may be very severely affected, while immune or partly immune ones are affected slightly or not at all. On the basis of my own wide personal experience in the forests and jungles of the Old World, covering a period of twenty-two years, I was never affected by any of these reputedly poisonous species, although many times I have handled fresh branches over and over again in the course of preparing botanical material; and in the same period none of my numerous associates ever reported cases of contact poisoning. I speak as a field botanist rather than as a physician. On the whole I suspect that it will be only on rare occasions that cases of anacardiaceous dermatitis will be noticed. If such cases do show up, then apply the same treatment that one would use for Rhus dermatitis at home.

THE CORNELL SELECTEE INDEX

A METHOD FOR QUICK TESTING OF SELECTEES
FOR THE ARMED FORCES

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BACKGROUND AND LITERATURE

That each person with a neuropsychiatric disorder revealed subsequent to induction costs the government \$30,000 to \$35,000, that twenty-seven hospitals with a capacity for 33,000 patients are devoted to the care of veterans from the first world war with neuropsychiatric disorders, that approximately a billion dollars has been spent on the care of these patients and that 60 per cent of all ex-members of military services requiring hospitalization are admitted for neuropsychiatric disabilities are facts which have been repeatedly presented in the literature.

As the result of the work of neuropsychiatric examination boards in the United States, the American Expeditionary Force of World War I had a far smaller percentage of nervous and mental casualties than did the armies of our allies. Even so, 110,137 neuropsychiatric casualties occurred in the Army from April 1, 1917 to Dec. 31, 1919 at a rate of 26 per thousand. It has been estimated, furthermore, that had it not been for the psychiatric selection process 40,000 more casualties of this type would have occurred in our forces. No small wonder that the editors of the volume on neuropsychiatry of the History of the Medical Department of the United States Army of World War I should express the belief that it would have been advisable to reject totally all mentally unfit individuals at the draft boards rather than to have selected some of them for full or even limited military service.

Since the same problems still exist, methods that attempt to refine the selective process are being studied or devised. In his comprehensive treatise, Miller and his collaborators¹ point out that "men who are liable to breakdown can frequently be detected during enlistment. . . . Since the treatment of psychological disorders, as compared with others, tends to be disproportionately costly and difficult, prophylaxis is correspondingly important."

Rosenberg and Lambert,² in a review of 200 consecutive case histories of soldiers discharged from the Army at Camp Lee, Virginia, because of neuropsychiatric disabilities, found that 83 per cent had had symptoms before induction. It was concluded that "the majority of the psychiatric casualties we encountered could have been eliminated at the induction board if relatively simple social service data had been available." Bowman³ sug-

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The work described in this paper was done under a contract, recommended by the Committee on Medical Research, between the Office of Scientific Research and Development and Cornell University.

This study was aided by a grant from the Josiah Macy Jr. Foundation.

1. Miller E.: The Neuroses in War, New York, Macmillan Company, 1940.
2. Rosenberg, S. J., and Lambert, R. H.: Analysis of Certain Factors in Histories of 200 Soldiers Discharged from the Army for Neuropsychiatric Disabilities, *Am. J. Psychiat.* 99:164, 1942.
3. Bowman, K. M.: Psychiatric Examination of Applicants in Armed Forces, *War Med.* 1:213 (March) 1941.

gested the use of the files of hospitals and courts, social service and school records by local draft boards in order to weed out unsuitable persons and to facilitate the work of the examining neuropsychiatrist. Other suggestions have been offered by Menninger and Greenwood,⁴ who felt that the work of the induction board psychiatrist was highly unsatisfactory since a reliable diagnosis could not be arrived at in three or four minutes. This was even more difficult because of the fact that the pertinent historical information was lacking.

Even with the assistance of supplemental technics, von Storch and his associates⁵ felt that it was impossible for one neuropsychiatrist to examine more than 50 recruits in one day and do an adequate job of it. It was their experience that no one neuropsychiatrist can do justice to more than 10 men per hour. The practice of allotting 50 selectees to one psychiatrist has been adopted at the Boston induction station, as was suggested by Bloomberg and Hyde.⁶

One type of selection is best exemplified by the method used at the Naval Training Station at Newport, R. I. Here the candidate is examined while he is naked, after he has been standing from three quarters to one hour for his physical examination. From a naval neuropsychiatric point of view this is an ideal time to examine the recruit, since he is physically and emotionally fatigued. Wittson and his associates,⁷ who have been using this method, find that of all men suspected at this initial examination one third are ultimately discharged.

It has been noted that in various Armed Forces Induction stations in the East (e. g. New York, Boston and Atlanta, and Fort Benning for Negro recruits) questionnaires of a neuropsychiatric nature are used. A statistically standardized procedure of broad and searching quality would be of inestimable value in preventing the induction of those who might not only destroy the morale of the fighting forces but may also do irreparable damage to themselves. This examination must pick out the obviously mentally disturbed and also those whose disability is subtly hidden or potential.

Porter⁸ suggests a list of fifteen basic personal attributes for inquiry which should enable one to prognosticate a breakdown under stress.

Flicker⁹ shows appreciation of the varied phases of the problem when he suggests that (1) something should be done in the matter of obtaining a psychiatric history, (2) 50 men to every neuropsychiatrist should be the case load for one day and (3) "a definite minimum neuropsychiatric blank be supplied, along the lines suggested by Aita, and that it be mandatory that this be completely filled out."

It becomes apparent from the consideration of the foregoing that it would be desirable to have a method which would attain uniformity, simplicity and objectivity, not to replace the intuition and experience of the neuropsychiatrist, but to supplement and improve his effectiveness. With this aim the Selectee Index was formulated.

AIM

The vast majority of persons who show evidence of difficulty in adjustment or "break down" under the circumstances of civil life can be expected to "break" under the circumstances of military life. Hence a procedure which would "screen" out the borderline and proved inadequate before induction would lessen the incidence of illness in the armed forces. To detect such persons is desirable because neuropsychiatric and psychosomatic disorders have become important military problems. Furthermore, because of a paucity of neuropsychiatrists, devices that are time and energy saving are essential.

The purpose of the Selectee Index is to furnish a quick and reliable means of detecting individuals who are likely to develop psychoneuroses and psychosomatic disturbances, especially peptic ulcer and allied syndromes. Although designed primarily for evaluation of selectees at induction stations, it may be employed in preinduction examination at Selective Service local boards as well as in replacement centers and in military hospitals.

METHOD

Numerous experiments involving test procedures, both standard and of our own devising, were carried out on a variety of groups of subjects (patients with peptic ulcer, anxiety states, other psychoneurotic states, psychotics, ambulatory hospital patients recovering from upper respiratory infections, medical students and selectees). As the result of these experiments an index was devised based on the results of three tests indicating the subject's neurotic and other abnormal reaction patterns as well as his self confidence, range of interests, decisiveness and the presence of sexual abnormalities.

These tests are self administered and may be given to individuals or to groups of persons. The tests require fifteen minutes to complete and may be scored in two minutes by any one with high school education. The method of scoring may be learned in less than one hour. The equipment for scoring the tests consists of three stencils, a table of equivalent weighted scores and a one page manual of instructions.

The first test presents an opportunity for occupational choice, designed to reveal the subject's range of interest, his work preferences and his acceptance of the male pattern. He is asked to indicate in a list of occupations those which he likes or dislikes. A previous study of homosexuals incarcerated at Rikers Island for asocial behavior, as well as other effeminate and homosexual subjects, demonstrated in a statistically reliable manner that certain occupations, e. g. interior decorator, dancer, window dresser, were chosen by these homosexuals with great frequency. This fact is utilized for the purpose of drawing conclusions concerning the individual's ability to accept the male pattern of our society.

The second test presents evidence of the subject's self evaluation. The subject indicates whether he believes that he would be "good," "poor" or is "in doubt" of his ability to manage specific situations. This test indicates the amount of self confidence, self esteem and decisiveness.

The third test, a questionnaire, consists of a neuropsychiatric and psychosomatic inventory of symptoms which are evidences of maladjustment. The questions in the inventory are of two types. Every fifth question and the last six, so placed for quick discernibility, are of a crucial nature, e. g. "15. Did you ever have a fit or convulsion?" These are called "stop questions" because

4. Menninger, W. C., and Greenwood, E. D.: The Psychiatrist in Relation to the Examining Boards, *Bull. Menninger Clin.* 5: 134, 1941.

5. von Storch, T. J. C.; Pratt, G. O.; Farrell, M. J.; Carrier, D. E., and Viets, H. R.: Observations and Suggestions Concerning Neuropsychiatric Examinations for the Army of the United States, *New England J. Med.* 224: 890 (May 22) 1941.

6. Bloomberg, W., and Hyde, R. W.: A Survey of Neuropsychiatric Work at the Boston Induction Station, *Am. J. Psychiat.* 99: 23, 1942.

7. Wittson, C. L.; Harris, H. I.; Hunt, W. A.; Solomon, P. S., and Jackson, M. M.: The Neuropsychiatric Selection of Recruits, *Am. J. Psychiat.* 99: 639, 1943.

8. Porter, W. C.: What Has Psychiatry Learned During Present War? *Am. J. Psychiat.* 99: 850, 1943.

9. Flicker, D. J.: Psychiatric Induction Examination, *War Med.* 2: 931 (Nov.) 1942.

any selectee who exhibits such a major symptom must be stopped for more intensive appraisal. The others have less serious implications, such as "11. Are you easily discouraged?" In scoring the index it is this third test which contributes most to the total score and to the "screening" process.

It is worthy of emphasis that each item in the index was incorporated only after having been exposed to item analysis and statistical validation.

For comparison and evaluation, the tests were given to a group of selectees in an experiment arranged by the New York City Selective Service authorities. Each subject was interviewed for fifteen minutes by a leading civilian neuropsychiatrist who had a good appreciation of the requirements for army life. Moreover, these neuropsychiatrists had been given an outline describing an interview procedure designed to aid in detecting important symptoms and to give a degree of uniformity to the interviews.

Similar experiments were carried out at New York and Boston induction stations where the index was

TABLE 1.—Incidence of Each "Stop Question" Among the General Selectee Population, Those Accepted or Rejected by the Interview Method in New York and Boston, and Those Discharged by the Army and Navy Because of Performance and Neuropsychiatric Disability.

"Stop Question"	General Selectee Population 1,000 cases %	Accepted by Interview Method at Induction 887 cases %	Rejected by Interview Method at Induction 113 cases %	Discharged by Army and Navy Because of Performance and Neuropsychiatric Disability 282 cases %
Alcohol.....no. 5	0.7	0.1	5.7	10.1
Headache..... 10	5.7	5.3	35.4	48.7
Fits..... 15	1.8	0.8	9.7	18.0
Drug addiction..... 20	0.8	0.7	1.1	3.8
Work record..... 25	7.2	6.7	11.0	11.1
Stomach..... 30	7.5	5.9	20.4	19.3
Hematemesis..... 35	2.6	1.6	10.7	14.8
Euresis..... 40	3.0	0.8	11.0	7.3
Mental hospital..... 45	0.7	0.2	4.4	11.7
Sleep walking..... 50	1.0	0.6	4.4	5.5
Diarrhea..... 55	2.1	1.4	8.0	9.3
Nervous breakdown 59	0.7	0.2	4.4	39.9
"Uclee"..... 60	0.4	0.2	1.4	8.3

used in conjunction with the routine neuropsychiatric interview.

The tests were also given to Army and Navy personnel about to be discharged for neuropsychiatric disorders. Here, test results were compared with actual military performance and the information acquired through intensive study at military hospitals.

RESULTS

A comparison of these groups with a normal population in regard to incidence of "stop questions" is shown in table 1.¹⁰ For example, less than 1 per cent of the normal and accepted groups suffer from alcoholism, while 5 to 10 per cent of the rejected and discharged groups do. Table 2 shows the frequency of "stop questions" for these groups. For example, 20 to 25 per cent of the normal and accepted groups have one or more "stop questions," while 70 to 83 per cent of the rejected and discharged men admit these significant symptoms. Table 3 shows the distribution of "weighted scores" ¹¹ for these groups. It should be noted that the

mean and standard deviation of the rejected group is considerably lower than that for the general selectee population and that the critical ratios between the groups compared are in all cases statistically significant. The effect of age on "weighted score" was studied, and it

TABLE 2.—Number of "Stop Questions" Among the General Selectee Population, Those Accepted or Rejected by the Interview Method and Those Discharged by the Army and Navy Because of Performance and Neuropsychiatric Disability.

Total Number of "Stop Questions"	General Selectee Population 1,000 Cases %	Accepted by Interview Method at Induction 887 Cases %	Rejected by Interview Method at Induction 113 Cases %	Discharged by Army and Navy Because of Performance and Neuropsychiatric Disability 282 Cases %
0	75.0	50.7	30.0	16.3
1	17.4	15.6	31.0	29.4
2	5.0	2.8	22.1	24.0
3	1.6	0.6	9.8	15.9
4	0.8	0.2	5.3	5.5
5	0.1	0.1	...	2.4
6	...	...	...	2.4
7	...	...	...	1.7
8	0.1	...	0.8	0.3
9	...	...	...	0.3
10	...	...	...	...

* One or more "stop questions" is the basis for referral for neuropsychiatric appraisal.

was found that the mean for a specific age varied but slightly from the mean of the group.

The selectee tests have been given to 5,435 persons. Results are presented for 3,955 individuals. Those for the remainder are not presented because the results of the neuropsychiatric interview were not available. Performance results may later become available for this group.

In the following experiments each subject was examined with the index and by a neuropsychiatrist whose opinion was accepted as a basis for comparison.

TABLE 3.—Distribution, Means, Standard Deviations and Critical Ratios for Weighted Scores Among the General Selectee Population, Those Accepted and Rejected by the Interview Method in New York and Boston, and Those Discharged by the Army and Navy Because of Performance and Neuropsychiatric Disability

Weighted Score	General Selectee Population 1,000 Cases	Accepted by Interview Method at Induction 887 Cases	Rejected by Interview Method at Induction 113 Cases	Discharged by Army and Navy Because of Performance and Neuropsychiatric Disability 282 Cases
57-60	414	392	22	17
53-56	218	231	17	31
49-52	175	154	19	42
45-48	77	61	13	29
41-44	52	38	14	23
37-40	10	3	7	35
33-36	15	3	12	37
29-32	6	1	5	35
25-28	1	1	0	16
21-24	1	0	1	4
20 and less	3	0	3	0
Mean	53.45	54.30	46.78	42.12
S. D.	6.20	4.92	9.92	9.48
C. R. (diff./S. D. diff.):				
Between 1,000 cases and 282 discharged.....				4.33
Between 887 accepted and 113 rejected.....				7.94
Between 887 accepted and 282 discharged.....				15.63

* Weighted scores of 44 or less are the basis for referral for neuropsychiatric appraisal.

SERIES I

Results are given for 307 selectees from the Greater New York area. Eighty-six per cent of those men rejected by the neuropsychiatrist were also "screened" by the index.

10. In these tables the general selectee population is composed of the group of 887 accepts and 113 rejects.

11. The simple sums arrived at as the first step in scoring are called "raw scores." By means of a statistical analysis these scores are reduced to a scale of evaluation called the "Table of Equivalent Weighted Scores," which gives the "weighted score."

SERIES II

A group of 1,863 selectees from Boston and its environs was examined with the Selectee Index at the Boston induction station. Here 80 per cent of those rejected after neuropsychiatric interview were "screened" by the index.

SERIES III

A group numbering 1,390 was tested at the New York City induction station. Of the 179 men rejected for psychiatric reasons, 158, or 87 per cent, were "screened" by the index.

SERIES IV

Of 210 men discharged from the Army for neuropsychiatric reasons and 72 discharged from the Navy for similar disorders, the index "screened" 90 per cent and 88 per cent respectively.

SERIES V

In a series different from those described, 63 subjects who had already been rejected by neuropsychiatrists attached to Selective Service local boards were reexamined by means of a second neuropsychiatric interview

forces induction station for Georgia. The index "screened" all of the 27 persons rejected by the interview method. An experiment was arranged at the Fort Benning induction station for Negroes, and the tests were given to 150 subjects. Of the 4 men rejected for neuropsychiatric reasons, the index "screened" 3.

In these experiments a larger number of men failed the index than were ultimately rejected. There is some evidence to indicate that some of the persons who failed the index but were accepted will ultimately prove themselves to be inadequate. The confirmation of this postulation will have to be postponed until data on their performance in the Army are available. Other persons failed the index but were accepted because (a) a question had been misunderstood or misevaluated by the subject or (b) of defects in the construction of the Selectee Index. About one third of those who failed the index were finally rejected.

Conversely, 10 to 20 per cent of those rejected by the interview method are not "screened" by the index and for substantially the same reasons that have been mentioned. This discrepancy represents 1 to 4 per cent of the general population, as shown in the chart.

TABLE 4.—Percentage of Neuropsychiatrically Unfit (as Ascertained by Interview Method and Military Performance) "Screened" by the Selectee Index

Psychiatric and Psychosomatic Disturbances *	New York		Boston		New York		Army		Navy		Total		Per Cent
	IM †	SI †	IM	SI	IM	SI	IM	SI	IM	SI	IM	SI	
Psychoneurosis													
Mixed.....	0	0	127	102	0	0	12	12	10	8	140	122	82
Anxiety.....	8	8	26	18	0	0	39	36	0	0	75	62	71
Miscellaneous.....	6	6	28	23	90	79	39	33	11	11	174	152	87
Constitutional psychopathic states.....	5	4	90	74	40	34	37	29	16	13	188	151	82
Psychotic states													
Dementia praecox.....	4	2	7	3	11	10	11	10	5	3	38	28	74
Miscellaneous.....	2	2	1	1	5	5	12	10	3	3	23	21	91
Ulcer.....	8	7	9	9	8	8	1	1	1	1	27	26	96
Migraine.....	0	0	5	4	4	4	0	0	3	3	12	11	92
Asthma.....	1	0	22	21	5	5	1	1	0	0	29	27	93
Arterial hypertension.....	2	2	17	8	0	0	0	0	0	0	19	10	53
Enuresis.....	3	2	6	6	3	3	0	0	4	4	16	15	94
"Immaturity".....	0	0	7	5	0	0	0	0	11	9	18	14	77
Stuttering and stammering.....	3	3	0	0	5	3	0	0	0	0	8	6	75
Epilepsy and convulsive disorders.....	2	2	8	8	7	7	7	7	5	5	29	29	100
Miscellaneous.....	0	0	8	6	0	0	51	49	3	3	62	58	93

* Classifications as quoted by the various induction stations and military hospitals. † Number of subjects rejected by interview method.

‡ Number "screened" by selectee index.

Unfortunately hypertension was included by some neuropsychiatrists as a neuropsychiatric disability. The justification for such a classification of these patients is lacking.

and with the index. Here the index "screened" only those men who had been rejected as the result of the second interview. Thus, 43, or 87 per cent, of the 49 men rejected as the result of the second interview failed to achieve a passing score on the index. In other words, all persons rejected as a result of a failing index score were also rejected as a result of the second neuropsychiatric interview.

SERIES VI

As a further step in this checking process, 50 selectees were given the tests after having been interviewed. In those cases in which the test results disagreed with the findings of the interviewer, the subject was examined again by a second neuropsychiatrist. The second examination differed from the first in that the interviewer had before him the information uncovered by the index to guide him in formulating a final opinion. In 4 cases the added information caused the second interviewer to arrive at an opinion opposite to that of the first.

SERIES VII

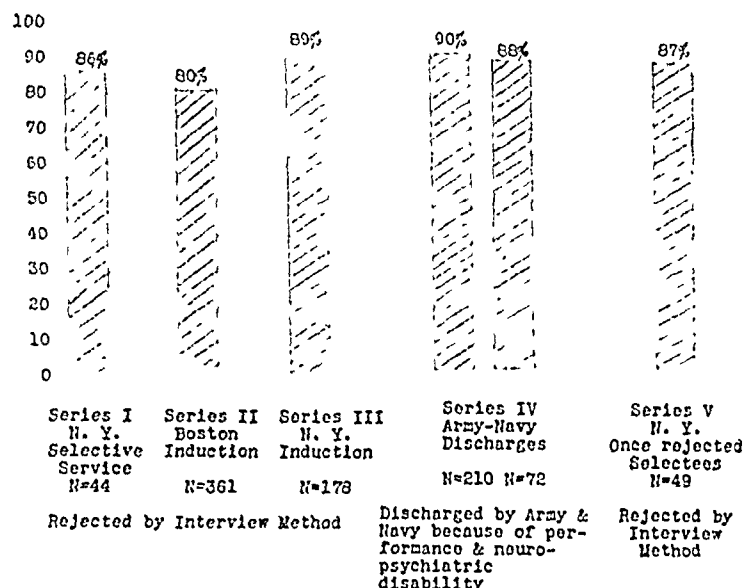
To ascertain whether cultural differences in another part of the United States would modify the value of the index, Southern white and Negro selectees were examined in Georgia. The tests were given to 230 Southern white persons at Fort McPherson, the armed

The equivalent of a seventh grade elementary education is necessary for the adequate understanding of the test items. In the northeastern part of the United States between 5 and 10 per cent of the population has not achieved this educational level and therefore the index is not applicable to this group. In certain parts of the South as high as 70 per cent of the Negro population could not take the index.

RECOMMENDATIONS FOR THE USE OF THE
SELECTEE INDEX

Since the index is self administered it might readily be included in the "processing" now in use for the "screening" of selectees. There would be a great advantage in having the index administered at the same stage at which the men are given a preliminary Wassermann test by the Selective Service authorities. It would then become a part of the history sent to the induction station along with the selectee on the day on which he is to be examined. This would present the examining neuropsychiatrist with a picture of the subject's neuropsychiatric state and would enable the physician to arrive at a more accurate and effective decision than at present. The ease with which the index is administered and scored makes it possible to use women, either civilian volunteers or military personnel, in this work.

Should this procedure prove impractical the Selectee Index could be used at the induction station, the same result being achieved as long as the index is administered and scored prior to the subject's neuropsychiatric interview. Use of the index at this stage, however, would be more costly in time and personnel.



Percentage of neuropsychiatrically unfit (as ascertained by interview method and military performance) "screened" by the Selectee Index.

It is recommended that a man achieving a passing score on the index be seen for a minute or two for confirmation. On the other hand, if he received a failing score the material uncovered by the index can be promptly used for establishing the selectee's status. Thus the neuropsychiatrist would have more time to spend with the frank and borderline individuals, which may comprise up to 40 per cent of all candidates. Under these circumstances this group referred for special consideration would contain most of those who should be rejected. For one reason or another the neuropsychiatrist may decide to accept a certain proportion of those who have received failing scores. This must be done on the basis of the examiner's interpretation of the selectee's neuropsychiatric equipment. From 80 to 90 per cent of those judged militarily unfit by the neuropsychiatrist are "screened" by the index.¹²

The index may also be used as an aid in classifying grossly, patients who have already reached the neuropsychiatric wards of Army and Navy hospitals. The information gathered by the index is valuable as a supplement to the hospital history of such patients. Here it may be given routinely by the admitting nurse. In such use of the index it would be more important to examine the individual answers to questions than merely to record the final score.

SUMMARY—CRITICISM AND EVALUATION

The Selectee Index has shown itself to be effective in indicating the presence of anxiety states, hypochondriasis, asocial trends, convulsive disorders, migraine, asthma, peptic ulcer and allied syndromes. It focuses attention on borderline clinical states that may be missed because they fall between other departmental classifications (i. e. so-called psychosomatic disorders; table 4). It is less effective in the "screening" of those likely to exhibit so-called monosymptomatic disturbances, e. g. hysterical palsies, and the prepsy-

chotic and early psychotic states. It is also defective in detecting obsessive states. Furthermore, it requires literacy which makes its universal application impossible. Although responses may be falsified, in practice we have noted this infrequently.

An important asset in the use of the Selectee Index is the ease and simplicity of administering and scoring. It is an effective time saver in placing before the interviewing neuropsychiatrist a clinical profile of the subject's personality defects. By bringing to the attention of the examiner a body of data as well as an indicator of the qualifications of the selectee, it should improve his accuracy and judgment. It is the brevity of the tests, their simplicity of scoring and their focus on special neuropsychiatric problems that recommend the use of the Selectee Index.¹³

Clinical Notes, Suggestions and New Instruments

MULTIPLE METATARSAL FRACTURES ASSOCIATED WITH OSTEOGENIC SARCOMA

HENRY W. MEYERDING, M.D., ROCHESTER, MINN.

The following report of a case of multiple metatarsal fractures associated with periosteal osteogenic sarcoma is worthy of record:

REPORT OF CASE

A boy aged 15 years was seen at the Mayo Clinic Oct. 25, 1929 because of a growth in his nose. He stated that he had consulted a physician because of frequent attacks of epistaxis, from which he had suffered for many years. Seven months prior to admission the physician, thinking that he would remove a polyp, found a firm tumor and removed a section of tissue, which on microscopic examination was reported as showing a spindle cell sarcoma. The tissue was submitted to a distinguished pathologist, who made a diagnosis of "cellular fibroma or sarcoma," and two treatments of radium were given. We made a diagnosis of benign fibroma of the nasopharynx. The tumor was treated by diathermy and radium, after which the patient had complete relief of symptoms. There was no other complaint at this admission, and the roentgenograms of the head and of the thorax were negative. The blood count, the results of urinalysis and the Wassermann reaction of the blood were also negative.

In April 1930, six months later, the patient returned to the clinic, a distance of 1,200 miles. He stated that two weeks prior to this time tenderness and a few days later swelling

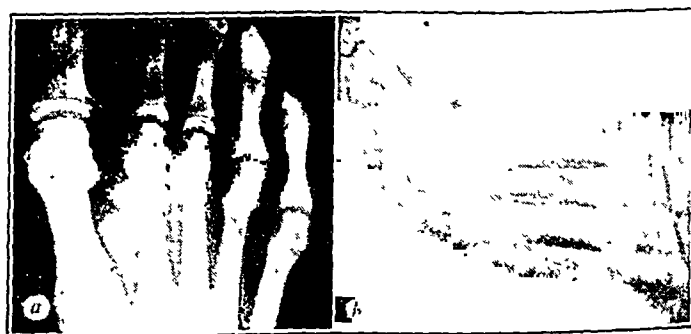


Fig. 1.—a, dorsal appearance of forepart of right foot, which shows spindle cell periosteal thickening in the distal half of the second metatarsal bone. There is pronounced elevation of the shaft of the second right metatarsal bone with no evidence of fracture. b, lateral view.

had developed across the forepart of the dorsum of the right foot. With rest and hot applications the swelling had reduced in size, but an apparent thickening was situated near the head

12. With a variation of the scoring method, 5 to 15 per cent of the general population is referred for special consideration. Although with this method only about 55 to 60 per cent of the total militarily unfit are earmarked, the large majority of this group will be found unfit on examination; a fraction will be borderline.

13. Test blanks and scoring materials are available to responsible agencies on request to the authors at Cornell Selectee Index Project P206, New York Hospital, 525 East Sixty-Eighth Street, New York. From the Section on Orthopedic Surgery, Mayo Clinic.

of the second metatarsal bone. The roentgenologist reported pronounced elevation of the periosteum of the shaft of the second right metatarsal bone with no evidence of fracture; roentgenograms of the thorax were negative. The forepart of the foot was tender on direct and lateral pressure. The patient did not recall an injury to the foot. Opinion varied as to the diagnosis: periostitis, infraction (Freiberg's infrac-

was feeling very well and had gained 10 pounds (4.5 Kg.) during a period of four months. Ten days prior to this admission, however, he had stepped on the right foot with the left foot and had injured the region of operation. Roentgenographic examination at home had been reported as showing sarcoma of the third metatarsal bone four days prior to admission. Our roentgenologist reported negative findings in the thorax, and a tumor involving the shaft of the third metatarsal bone, but no recurrence in the region of the second metatarsal stump. There was an enlargement of the lymph nodes of the groin. Excision of a node from the groin was advised and I felt that the tumor of the third metatarsal bone should be malignant in view of the previous pathologic findings but that possibly it was a fracture with callus (metatarsal fracture). Dec. 23, 1930 a lymph node was removed from the right groin, and on pathologic examination it was reported to be the seat of inflammation. The third metatarsal bone was exposed through a dorsal incision, and a grayish tumefaction with definite fracture was demonstrated. In view of the home physician's opinion, the previous pathologic diagnosis of osteosarcoma, the roentgenologist's report of tumor and the anxiety of the patient's mother, it was thought best to excise the metatarsal bone and make further studies to distinguish sarcoma from fracture with callus. This procedure was carried out, and subsequently the pathologist reported periostitis and an old fracture with formation of callus. Further irradiation was not advised, and the patient made an uneventful convalescence, after which he returned home on the seventeenth postoperative day. About three months later the mother reported that he was well, gained weight, slept well and walked well (fig. 3 *a* and *b*).

Six months later roentgenograms were negative except for periostitis. Approximately nine months later roentgenograms were forwarded to us which revealed periostitis of the first and fourth metatarsal bones with apparent fractures. About a month later the patient returned to the clinic for further treatment because of pain in the foot following a period of walking for four days. Roentgenograms were taken and revealed periostitis with fracture of the first and fourth metatarsal bones of the right foot (fig. 4 *a* and *b*) but those of the thorax were negative. The patient also had a severe infection of trichophytosis and received treatment under the supervision of a dermatologist. There were enlargement and tenderness of the inguinal lymph nodes. The temperature was normal. The patient improved rapidly under treatment and was able to walk well. He returned to his home Oct. 27, 1931. He was advised to send roentgenograms to us at a

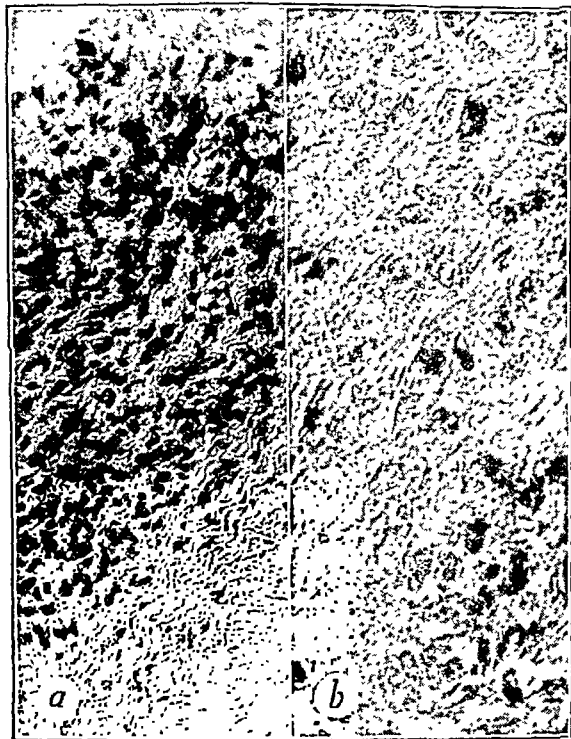


Fig. 2.—Tissue from second metatarsal bone. *a*, $\times 185$; *b*, $\times 500$

tion) and periosteal sarcoma (possible metastasis) being considered in the absence of definite roentgenologic evidence of fracture. Roentgenograms of the opposite foot and of the long bones of the other parts of the body proved to be negative. The patient's mother demanded that an exploration be made, as she had been told by the home physician that the mass in the metatarsal region was a sarcoma.

Operation was performed on April 9, 1930, at which time a hard, spindle shaped bony mass, involving the distal half of the shaft of the second metatarsal bone, was resected. The pathologist's preliminary opinion was that the lesion was an exostosis but later after decalcification, his final report was osteosarcoma, grade 2 (Broders' method). Two low voltage roentgen treatments were given to the foot. The wound healed by primary intention and one month after the operation the patient returned to his home, where he remained under the supervision of his physician (figs. 1 *a* and *b* and 2 *a* and *b*).

Roentgenograms taken five weeks after operation showed resection of the distal two thirds of the second metatarsal bone, and the remainder of the metatarsal bones were normal. Roentgenograms of the thorax were negative. Three months later the patient had gained in weight. His weight at this time was 137 pounds (62 Kg.), whereas eighteen months previously it had been 100 pounds (45 Kg.). He had received thirty-five injections of Coley's toxins, $\frac{1}{4}$ to 13 drops, during a period from June to August. Roentgenograms did not show any recurrence in the remaining proximal third of the second metatarsal bone, but there was some atrophy of the bones of the foot. Roentgenograms of the thorax were negative. Another low voltage roentgen treatment was given to the foot (Aug. 18, 1930). The patient was walking and seemed in good health. The examination of the nose did not show any recurrence of a lesion. The patient returned home.

About four months subsequent to the foregoing visit, the patient again reported for observation. He stated that he

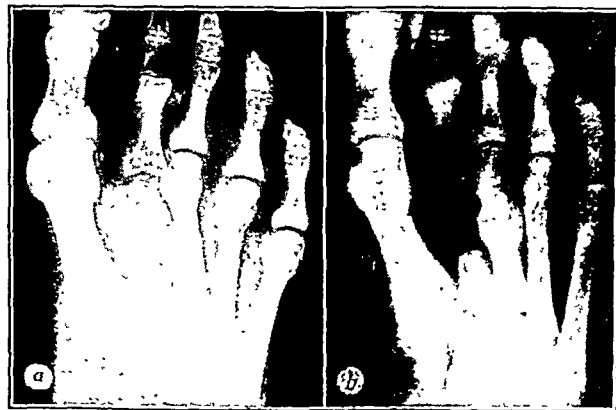


Fig. 3.—*a*, anteroposterior view, May 6, 1930, demonstrates partial resection of the second metatarsal bone. Note normal appearance of other metatarsal bones. *b*, anteroposterior view of right foot four months later, which shows resection of a portion of the second metatarsal bone and a fracture with pronounced periosteal thickening of the third metatarsal bone (march fracture).

later date so that they might be compared with those that we had of the foot. At this time there was no evidence of recurrence of the nasal tumor.

At the time of the foregoing visits I was suspicious of a metatarsal fracture and questioned the patient as to the pos-

sibility of an old injury of the right foot. For the first time he remembered that he had been injured four years prior to this admission. He stated that in October 1927 a horse fell on his right foot, which was crushed and held by a steel stirrup, following which there were pronounced ecchymosis and swelling like a watermelon. He further stated that he had been unable to walk on the foot for three weeks and that it had been two months before the foot felt well. Furthermore,



Fig. 4.—a, anteroposterior view which demonstrates partial resection of the second and third right metatarsal bones and evidence of fracture and periosteal thickening of the fourth right metatarsal bone. There apparently also is a fracture of the first right metatarsal bone with secondary cortical thickening. b, lateral view.

he said that two years before admission, while he was running, something gave way in the foot and he could hardly walk because of pain, and he thought that there had been a little swelling in the foot before it gave way. It was then that he had consulted a physician, who took a roentgenogram and made a diagnosis of sarcoma of the metatarsal bone.

July 29, 1932 the patient was admitted again at the clinic; this time he was feeling well and his weight was 158 pounds (72 Kg.). He walked at least 4 miles a day without difficulty except for a hammer toe. There was no evidence of recurrence of the nasal tumor, and the roentgenograms of the lungs were negative. The roentgenograms of the right foot, however, showed the region of resection of the second and third metatarsal bones and the fractures of the first and fourth metatarsal bones which had healed. Aug. 1, 1932 operation was performed while the patient was under local anesthesia. Because of the deformity a portion of the proximal phalanx of the fourth toe was excised. There was no recurrence of the tumor. The pathologist's examination of the bone gave negative results. The trichophytosis was improved.

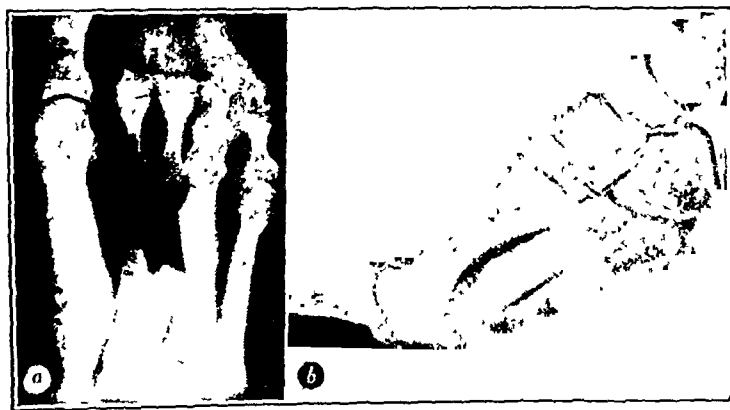


Fig. 5.—a anteroposterior view taken May 10, 1934, which demonstrates resection of the second and third right metatarsal bones, and the fractures of the first and fourth right metatarsal bones healed and the callus absorbing. b, lateral view.

The patient returned home in one week and wished to know if he could play basketball.

May 9, 1934 the patient brought his sister to the clinic and reported for a reexamination himself. His weight was 168 pounds (76 Kg.). He had not had any pain or recurrence of symptoms in the foot and had been able to walk 20 miles with no sign of trouble. There had been no loss of weight. The roentgenograms of the thorax were negative. The ones

of the foot showed some thickening of the periosteum of the fourth metatarsal bone and absence of the second and third metatarsal bones (fig. 5 a and b). Examination of the nose did not show any recurrence of the tumor. The blood count had been normal and the results of urinalysis negative throughout the entire time this patient had been under our observation.

The patient reported by letter in February 1938 stating that he had not had any further trouble with his leg or foot and had not had any further treatment. His weight was 190 pounds (86 Kg.) and he was in perfect health. He had been working daily in a shingle mill, where he had had to carry heavy blocks of wood all during the working hours.

April 10, 1943 the patient was seen again at the clinic because of another nasal hemorrhage. He stated that about two months prior to this admission his physician had removed a nodule from his nose. Examination did not reveal any evidence of recurrence of the nasal tumor, but there was suppurative hidradenitis of the left axilla, for which the patient was given three low voltage roentgen treatments. The blood count and the results of urinalysis were negative. He stated that he had had no difficulty whatever with the right foot and had been able to work a full day and to walk miles.

COMMENT

This case has been most interesting and I have followed it for many years. During this time I have made a study of metatarsal fracture and have written about it.¹ The second metatarsal bone, which was resected at the time of the first operation, had been saved. The pathologist, Dr. Broders, was requested to reexamine this tissue and on Sept. 10, 1943, thirteen years postoperatively, sent a report to me. He stated that in his opinion the lesion of the second metatarsal bone represented a "periosteal osteogenic sarcoma" and selected two photomicrographs (fig. 2 a and b). I believe that this is a case of multiple metatarsal (march) fractures of the right foot in which the tissue of the primary lesion of the second metatarsal bone had undergone malignant change.

While I have had sufficient opportunity to recognize the wide divergence of opinion concerning the interpretation of microscopic findings in cases of lesions of bone, I feel that this patient originally had a metatarsal fracture. The possibility of sarcoma of the nose with metastasis to the metatarsal bone was considered by his physician and surgical treatment insisted on by the parent, all of which led to excision of the tumor mass which Dr. Broders diagnosed as osteogenic sarcoma. I shall quote directly from my surgical notes made on April 9, 1930: "We were suspicious of a periosteal sarcomatous malignancy and thought best to take out the tumor. A specimen of the tumor was sent to the laboratory for decalcification and study. The tumor was hard and may be osteogenic in type. I tried to get a history of trauma, thinking the condition might be a low grade periostitis following injury, but we were unable to prove any injury at this time." This case, therefore, represents a thirteen year cure of osteogenic sarcoma with multiple metatarsal fractures.

1. Meyerding, H. W., and Pollock, G. A.. March Fracture; Deutsch-Jaender's Krankheit, Marschgeschwulst, Fussgeschwulst, Marschfraktur, Fracture-de-Recrue, Pied Débile, Pied Force, Pied de Marche, l'Enflure du Pied, Pied Surchargé, Surg., Gynec. & Obst. 67: 234-242 (Aug.) 1938; March Foot, Mil. Surg. 56: 593-594 (June) 1940.

Growth of Scientific Knowledge on the Vitamin Needs of Man.—The growth of our understanding of the vitamin needs of man is a record of much blundering ignorance, some wishful thinking and a slow progress through controlled observation and experiments on man and other beasts. Blundering ignorance as to food composition and man's dietary needs brought on us the classic vitamin deficiency diseases (rickets, scurvy, beriberi, pellagra). The striking results of good food therapy in these diseases have engendered in our generation the utopian hope that a greater abundance of vitamins will rid man of nearly all real and imaginary ills. But more and better controlled observations and experiments will restore sense and scientific sanity, will remind us again that life is just not that simple.—Carlson, A. J.: The Growth of Scientific Knowledge on the Vitamin Needs of Man, *Journal-Lancet*, November 1943.

Special Article

AMERICAN HEALTH RESORTS

TYPES OF TREATMENT ADMINISTERED AT HEALTH RESORTS

M. B. JARMAN, M.D.

HOT SPRINGS, VA.

These special articles on spa therapy and American health resorts were prepared under the direction of the Committee on American Health Resorts. The opinions expressed are those of the authors and do not necessarily reflect the opinion of the committee. These articles may be published later as a Handbook on Health Resorts.

For convenience of discussion the types of treatment administered at health resorts fall under two headings: (1) the regimen which is common to all health resorts and which has to do with such items as rest, exercise, and dietary regulation; (2) therapeutic procedures which are used extensively in health resorts but which vary at the different resorts depending on their natural facilities.

THE REGIMEN

It is difficult to visualize a regimen at any health promoting institution in which emphasis is not placed on the regulation of rest, exercise and diet. These measures constitute the difference between the existence of a regimen and the lack of it. The regimens at different resorts differ in details but these items are basic. They supply the framework into which the particular natural resources of therapeutic value of a given resort may be fitted in the planning of the therapeutic program.

One resort may utilize to the fullest extent the components of climate, such as sunshine, temperature and relative humidity, with which it is endowed by virtue of its geographic location. Another makes use of sea bathing and the climate which goes with its situation on the seacoast. Others use mineral spring waters for drinking and bathing purposes. When these and other natural resources are used at health resorts for health purposes they are not used alone but as a part of a regimen planned with proper consideration for the needs of the patients treated.

THERAPEUTIC AGENTS EXTENSIVELY USED AT HEALTH RESORTS

Separate articles in this series have been written on "underwater gymnastics," "climate and disease" and "thalassotherapy." No further mention will be made of these. Other types of therapy extensively used but not the subjects of separate articles will be discussed briefly. For the most part these consist of various forms of physical therapy. Years before medical schools¹ began to teach the subject or before hospitals or clinics installed departments of physical therapy, many health resorts were making extensive use of some of its forms. Among these are hydrotherapy, which includes both the drinking of water and baths, light, massage, heat, mud and to a lesser degree electrotherapy.

Hydrotherapy.—A large percentage of health resorts are spas. The use of water in treatment is the distinguishing feature of such institutions. At some the drinking of water is stressed; at others, baths are emphasized; at many, both are used and these are combined with other health promoting procedures which constitute the regimen of the spa.

Drinking Water.—When the drinking of a particular water is stressed at a spa, such a water is often referred to as a "mineral water." A satisfactory definition of a "mineral water" is difficult to find. Here are some samples: The Quality of Water Division of the United States Geological Survey finds it convenient for statistical purposes to define a mineral water as "one sold in a bottle!"² The International Food Congress held in Paris in 1909 adopted the following definition: "A mineral water is a natural water proposed for consumption on account of its special therapeutic or hygienic properties." The geologist defines a mineral water as "one derived from deep-seated natural sources." The chemist thinks of a mineral water in terms of the amount of dissolved minerals it contains and hesitates to classify a water under this heading unless it contains at least 1 gram of dissolved minerals per liter of water. From the medical point of view mineral water has been defined as "one from natural sources which has therapeutic value." Other definitions are "any natural water which is used on account of special constituents" and "a natural water containing sufficient salts or gases in solution to give it its properties and peculiar taste." From these samples—and others not listed—one in search of a definition of "mineral water" has a great variety of proposed definitions from which to make a choice.

At some spas the drinking of water is almost dramatized. It is done according to precise directions as to time and amount and sometimes to the accompaniment of music. This provides one means for getting the patient to take enough water and seems to give some types of patients a sort of spiritual uplift. Water taken internally serves as a diuretic, and some waters are effective saline cathartics.

There are those³ who feel that some natural waters possess peculiar properties of therapeutic value—now resting on an empirical basis—which will be established scientifically at some future date when the methods of scientific investigation shall have been improved sufficiently and applied to the solution of the problems involved. In support of this feeling attention is directed to well known examples in the history of medicine in which therapy was long used and well established on an empirical basis, only to be explained scientifically some time later. In the field of mineral waters an example often cited is that of the springs in Austria famed as "goiter waters" years before the discovery of the iodine content of the water helped to explain its effect on the function of the thyroid gland. When claims are made for unusual therapeutic values of waters, suggested explanations for such claims often include reference to "catalytic agents" or "radioactivity." Physicians who admit freely that chemicals occurring in natural waters will bring about the same

2. Collins, W. D.: Mineral Waters in 1923, U. S. Geological Survey, Department of Interior, p. 109.

1. Sanger, W. T.: Physical Therapy in Education and Research, Arch. Phys. Therapy 22: 581-583 (Oct.) 1941.

3. Baudisch, Oskar, and Davidson, David: Natural Waters in the Light of Modern Research, Arch. Int. Med. 40: 496-520 (Oct.) 1927.

pharmacologic action as do chemicals derived from other sources when administered in the same dosages become skeptical when the claim is made that the chemicals in natural waters will bring about a pharmacologic action different from that of the same chemicals derived from other sources. The application of new theories and improved technic in research may in the future prove that chemicals which are now believed to be the same are in reality not exactly the same. Such a development might explain in scientific terms some of the results of mineral water therapy which now rest on an empirical basis.

Many physicians who prescribe the use of mineral waters and others who have given some thought to the subject are of the opinion that more often than not the most important chemical in the prescribed potion is water. The psychologic effect of prescribing mineral water according to exact directions is recognized fairly generally. Another article in this series deals with trace elements in waters. It is not likely that unusual claims made for mineral waters will be recognized by the medical profession unless such claims can be established when judged by scientific standards of the level applied in the evaluation of other therapeutic measures. In spite of this, physicians of spas have learned in many instances to make use of the waters at hand for drinking purposes in planning the regimen of the spa; and, in the effect that drinking of the mineral water has on the feeling of well being of the patient, it is by no means the least important part of such a regimen.

Baths.—The great variety of baths given at spas can only be listed here. Among the more important are the onge bath, tub bath, evaporation bath, whirlpool bath, carbonated bath (Nauheim), steam bath (Russian), mud pack or bath, sitz bath, medicated bath, brine bath, sulfur water bath, cabinet baths of several varieties, cold spray, needle douche or spray, alternating hot and cold douche (Scotch), fan douche, Vichy douche and Aix douche. Some spas are equipped with pools adapted for administering underwater gymnastics. Continuous baths are more likely to be used in institutions for the treatment of the mentally sick, and baths of the type given in the Hubbard tank are more common in the departments of physical therapy of hospitals.

For detailed descriptions of these baths, the technic of administering them, their physiologic effects and the indications for their use, the reader is referred to modern textbooks on physical therapy.⁴

In the administration of hydrotherapy at health resorts an attempt is made to take advantage of the natural resources with which the particular resort is endowed. One such resort may have an abundance of naturally carbonated water. Such an institution is supplied by nature with one of the essentials of the carbon dioxide (Nauheim) bath. Advantage is taken of this natural resource, and the resort is organized accordingly for treating patients suffering from chronic cardiovascular diseases. A warm spring in a suitable climate may determine the site of an institution for treating victims of poliomyelitis. Nature provides the warm water and the climate, and man develops a properly equipped and staffed institution in this location for the use of underwater gymnastics and other recognized

treatment for such patients. Another resort may have an abundance of naturally hot water. Advantage is taken of this circumstance, and the resort is equipped to give baths in which the physical properties of the water—aside from any consideration of its chemical content—are of prime consideration.

At the better spas hydrotherapy is administered under medical supervision. The prescribing physicians look on this as a means of utilizing the facilities at hand to the best advantage in giving the patient as a part of his regimen a well established and a very useful form of treatment.

Light.—Light is recognized as a useful therapeutic agent. The sun is an inexpensive source of light. Solar radiation does not reach all parts of the earth's surface with equal intensity. The intensity varies with the latitude, season, hour, elevation and atmospheric conditions, such as the moisture content and the presence or absence of dust and smoke. For these reasons health institutions have been located in certain parts of the world because of the relative intensity and constancy of the solar radiation. In other words, the site of the institution is determined by this particular natural resource just as the site of a spa is determined by another natural resource, namely a group of springs. The Swiss Alps are an example, and there are many localities in the United States adapted by nature for this purpose.

The two chief components of sunlight of recognized use in therapy are infra-red rays and ultraviolet rays. Because sunlight is not subject to control, because one type of radiation may be desired without the other and for the further reason that there is an abundance of enterprising manufacturers of electrical apparatus, both types of rays have been produced artificially. Textbooks⁵ on physical therapy describe this apparatus, tell how to use it and give the present concepts of the physiologic actions of the different types and the indications for their use.

Light supplied by direct rays from the sun and light supplied by artificial means provide a type of therapy extensively used at health resorts.

Massage.—This form of physical therapy, extensively used at health resorts, has been the means of giving a great deal of comfort to a great many people. Manual massage and mechanical massage have both been used. Excellent descriptions of the technic⁶ and the present concepts of the physiologic effects⁶ of massage can be found elsewhere. Manual massage given by trained masseurs under medical supervision constitutes an important part of the regimen at many resorts. Some health resorts are equipped with a complete set of machines of the type devised by Dr. Gustaf Zander of Stockholm for active and passive exercise of the voluntary muscles. Even at resorts or hospitals where these machines have been installed at great expense and are still available, little use is made of them because it has been found that the purpose for which they were designed can be accomplished more effectively, more safely and less expensively by other means. The physician, whether at a health resort or not, who has at

5. Coulter, John S.: *Technic of Massage*, in *Handbook of Physical Therapy*, pp. 88-95.

6. Pemberton, Ralph: *Physiology of Massage*, in *Handbook of Physical Therapy*, pp. 78-87. Pemberton, Ralph; Coulter, John S., and Mock, Harry E.: *Massage*, J. A. M. A. 94: 1989-1997 (June 21) 1930.

4. *Handbook of Physical Therapy*, ed. 3, Chicago, American Medical Association, 1939. Krusen.¹

his command intelligent men and women well trained to give massage is armed with a therapeutic tool the value of which is difficult to estimate when measured in terms of the help and comfort rendered to patients.

Heat.—A recently published textbook⁷ on physical therapy devotes one hundred and thirty pages to the subject of thermotherapy and many more pages to diathermy. To such a textbook one should go for information as to the sources of heat both for local and for general application, its physiologic effects, and indications for and contraindications to its use. Heat is mentioned here simply because it is used extensively at health resorts as it is wherever sick people are treated. As a means of applying heat some resorts utilize their natural resources, such as hot water or mud, for the purpose but few confine themselves solely to these methods.

Mud.—Mud baths and mud packs are sometimes used as a method of applying heat. Muds have been classified according to their diminishing silicate content as (1) purely mineral, (2) mainly mineral and (3) mainly vegetable.⁸ The application of mud therapy consists of baths in specially built tubs or mud pools and the local application of mud packs. The use of mud in treatment is a much more common practice at European resorts than at those of America. As one example of this difference I found frequent references in European literature to the use of mud in the treatment of disorders of the genitourinary tract, whereas in a modern American textbook⁹ on gynecology and two recently published textbooks¹⁰ on urology I was unable to find a reference to the use of mud in these specialties. It appears from examination of the literature that American physicians, with some exceptions, are in accord with the sentiments expressed in these statements: "Often vague claims are advanced for specific therapeutic actions of certain types of mud. There is as yet no convincing proof that any such mud contains any constituents which enhance its effectiveness, when applied to the surface of the body. . . . It would seem that there are no particular advantages of mud packs over the simpler and cleaner methods of local application of heat."¹¹

If the application of heat to the surface of the body is needed, the use of mud provides one method by which it can be done. This method is made use of as a part of the regimen at European and—to a lesser extent—at American resorts.

Miscellaneous.—Many other types of treatment, of course, are administered at health resorts. The various types of electrotherapy are often made available to complete the physical therapy setup. One form of this—either conventional or short wave diathermy—is now used almost universally at resorts as a method for deep administration of heat. Since the people who go to health resorts are subject to the same ills as are people in general, no type of treatment is excluded.

7. Krusen, Frank H.: *Physical Medicine*, Philadelphia, W. B. Saunders Company, 1941.

8. Singer, Charles L.: *Effective European Methods of Hydrotherapy Neglected in the United States*, Arch. Phys. Therapy 17: 631-635 (Oct.) 1936.

9. Crossen, Harry Sturgeon, and Crossen, Robert James: *Diseases of Women*, St. Louis, C. V. Mosby Company, 1941.

10. Keyes, Edward L., and Ferguson, Russell S.: *Urology*, ed. 6, New York, D. Appleton-Century Company, 1936. Dodson, Austin L.: *Synopsis of Genitourinary Diseases*, ed. 3, St. Louis, C. V. Mosby Company, 1941.

11. Krusen, Frank H.: *Physical Medicine*, Philadelphia, W. B. Saunders Company, 1941, chapter 3, p. 151.

Council on Pharmacy and Chemistry

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING STATEMENT.
AUSTIN E. SMITH, M.D., Secretary.

USE OF ESTROGENIC SUBSTANCES FOR UTERINE BLEEDING

Clinical study of irregular menstruation during the last decade has suggested to many observers that the occurrence of prolonged flows, excessively vigorous flows and unduly frequent flows may all be evidences of hypofunction of the ovaries. Quantitative information is not available to decide whether this means decreased amount of estrogenic hormone production or of progesterone production or chronologic variation in the cyclic production of these materials. The most frequent accompaniment of such bleeding history has been the persistence of the estrogenic effect in the endometrium, sometimes accompanied by the development of the picture known as glandular and cystic hyperplasia of endometrium. Carefully conducted clinical experiments have indicated that such flowing may be interrupted by the use of large doses of estrogenic hormone or synthetic estrogen. Some attempts have been made to restore regular cycles of bleeding by administration of estrogen followed by a combination of estrogen and progesterone, or estrogen followed by progesterone alone. The clinical benefits obtained by such methods have been at least promising, although there is not adequate evidence to justify claims for cure of a condition which is frequently persistent in terms of months or years.

Before such therapy is applied, it is considered important that careful investigation should be made to eliminate other causes of bleeding tendencies systemically and also to eliminate local pelvic disorders of neoplastic or inflammatory type. Occasionally it may be wise to use very brief courses of estrogen to arrest bleeding so that such studies can be carried out immediately after the cessation of the flow. With such precautions in mind, additional uses of estrogen seem warranted, and the following claims will be recognized in N. N. R.:

It has been found possible to interrupt the prolonged and excessive flowing of many women with uterine bleeding of probable endocrine origin by brief courses of intensive estrogenic therapy. This is considered safe practice only when the interval of freedom from bleeding is used to eliminate local pelvic lesions as the cause of the flowing. The subsequent administration of sequences of estrogenic substances and progesterone to reestablish cycles of flowing is a possible method of alleviating a condition which is widely believed to result from deficiency of one or both of the ovarian hormones.

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

AUSTIN E. SMITH, M.D., Secretary.

DIETHYLSTILBESTROL (See New and Nonofficial Remedies, 1943, p. 403).

The following additional dosage form has been accepted:
GEORGE A. BREON & COMPANY, INC., KANSAS CITY, MO.
Tablet Diethylstilbestrol: 5.0 mg.

THIAMINE HYDROCHLORIDE (See New and Nonofficial Remedies, 1943, p. 590).

The following dosage form has been accepted:
McKesson & Robbins, Inc., Bridgeport, Conn.
Tablets Thiamine Hydrochloride: 0.5 mg., 1 mg. and 3 mg.

NICOTINAMIDE (See New and Nonofficial Remedies, 1943, p. 598).

The following dosage form has been accepted:
WILLIAM R. WARNER & CO., INC., NEW YORK
Ampul Solution Nicotinamide, 100 mg. per cc.: 1 cc.

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SATURDAY, JANUARY 22, 1944

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PATHOLOGIC LESIONS LIKE THOSE OF RHEUMATISM

The possibility that the cardiac and other lesions in rheumatic fever might be the result of reactions of hypersensitivity to bacterial products has received much attention. Many attempts have been made to produce Aschoff bodies by injecting bacteria into sensitized animals, but so far without conclusive results. The rheumatic lesions are apparently of a strictly specific nature. In the course of their study of tissue reactions of rabbits hypersensitive to serum, Rich¹ and his associates observed not only arterial lesions apparently identical with those of periarteritis nodosa but also

cardiac lesions resembling closely the lesions of rheumatic carditis. The rabbits were killed one to five weeks after the systemic reaction to horse serum.

In nature and situation cardiac lesions in such rabbits corresponded closely to the lesions of rheumatic carditis: there was focal edema of the connective tissue with disintegration of collagen fibrils; also pericardial, valvular and mural inflammatory infiltrations with cellular foci in the endocardium and about the arteries in the myocardium. Besides macrophages and lymphocytes these foci contained cells peculiar to the Aschoff body, particularly about areas of degenerated collagen. These structures in the heart of rabbits hypersensitive to horse serum are well illustrated in the paper by Rich and Gregory.²

There is no question that the rabbit lesions described closely resemble those of rheumatic carditis. Rich and Gregory discuss in detail the "circumstances compatible with the view that the lesions of rheumatic fever may be the results of focal reactions of the anaphylactic type" but without making any claims that the genesis of rheumatic fever has been explained. Their results are significant, however, because they indicate promising lines for further study. Reactions of anaphylactic nature may play a larger part in human disease than now understood.

The article by Selye and his associates in this issue of *THE JOURNAL* (page 201) on the hormonal production of arthritis describes results of an elaborate experimental attack on rheumatic and related problems from a different angle. In brief, the Canadian investigators report that in animals, particularly the rat, relatively large doses of desoxycorticosterone acetate under certain conditions can cause polyarthritis associated with the formation of Aschoff bodies in the heart and at times periarteritis nodosa, besides nephrosclerosis and hypertension.³ This polyarthritis may microscopically resemble that of rheumatic fever. It was produced more readily in thyroidectomized or adrenalectomized than in intact rats, especially on exposure to cold. The results are interpreted to indicate that "the adrenal cortex may play an important role in the pathogenesis of rheumatic and rheumatoid conditions in man."

As the report does not mention bacteriologic studies of the experimental animals, the question of the possible role of infection in the results, especially in the acute polyarthritis, must be left open at this time. The results in general, including those of the survey of the clinical literature, do appear to support the view that "hormonal factors can act either as causative

2. Rich, A. R., and Gregory, J. F.: Experimental Evidence That Lesions with the Basic Characteristics of Rheumatic Carditis Can Result from Anaphylactic Hypersensitivity, *Bull. Johns Hopkins Hosp.* 72: 239 (Oct.) 1943.

3. Selye, Hans, and Pentz, E. S.: Pathogenetical Correlations Between Periarteritis Nodosa, Renal Hypertension and Rheumatic Lesions, *Canad. M. A. J.* 49: 264 (Oct.) 1943.

1. Rich, A. R.: The Role of Hypersensitivity in Periarteritis Nodosa, *Bull. Johns Hopkins Hosp.* 71: 123 (Sept.) 1942.

or as predisposing agents in the production of joint lesions." These experiments on the actions of the adrenal cortex in the production of disease open another promising field for further investigation.

MAINTENANCE OF EDUCATIONAL STANDARDS IN MEDICAL EDUCATION IN WARTIME

The freedom of universities to choose their faculties without interference by political, family, social or other influences is a strong bulwark of education. This truth, highly important at all times, is no less valid now, particularly in medicine, dentistry and engineering. These forms of specialized training contribute immediately to the prosecution of the war. The maintenance of standards in teaching concerns the future of universities as centers of education and research. In medicine the care of patients, both civilian and military, is an additional responsibility of university staffs.

Our principal efforts are now bent to provide medical graduates in large numbers and in the shortest time consistent with reasonably good preparation. Much has been said about maintenance of teaching and hospital staffs, but comparatively little attention has been given to the directors of departments. The departmental head is a leader in all the work of his division; often he exercises an influence in the conduct of associated sectors in the university. Some directors of medical departments have been able to accept assignment to military and other governmental duties because a competent assistant can substitute adequately. The departmental heads who remain often do so because a satisfactory understudy is not available. Among those who remain at their posts, death and disability take their toll at the same rate in war as in peace, and replacement becomes a matter of serious and often urgent moment. The selection of a new director is just as significant in war as in peace, because the appointment is permanent. Thus the present and the long future of the universities are at stake.

The number of new directors at any given time is not large and probably of little consequence in reference to the number of professional men required for the armed forces. The wide ramifications of education are such that the freedom of choice in selection of faculty members has a bearing on the future of our country only second in importance to victory. A sympathetic understanding of the matter by the military agencies must lead to cooperation. Failure to comprehend these realities may limit the choice of teachers to those physically disqualified for military service, those sadly lacking in desire to serve, those too old to be useful to the government and refugees from foreign oppression. No doubt suitable directors may be found among individuals in these categories. However, common justice and future developments should not permit exclusion from

the list of candidates of those who have elected to serve their country in active service. Zeal for education is the keystone of democracy. This principle should be a guide to all concerned with our nation's welfare. Proper cooperation of military authorities with civilian educators in obtaining release from military duties whenever feasible of those concerned with direction of education in professional schools is fundamental to postwar professional rehabilitation.

Current Comment

TSUTSUGAMUSHI FEVER

Tsutsugamushi fever, called also scrub typhus, mite bite fever, tropical typhus and other names, is endemic in Sumatra, New Guinea, Java, Borneo, Formosa, Japan, Australia and the Federated Malay States. Scrub typhus is acquired on exposure to certain types of vegetation in circumscribed areas of untilled open country and especially land that has been cleared of jungle and has subsequently been overrun with weeds and scrub. The etiologic agent is *Rickettsia orientalis*. This agent is mite born. Corbett¹ points out that the primary pathologic changes include vasculitis and perivasculitis with slight tendency toward thrombus formation. The perivascular extension of the infection involves the parenchyma of various organs, and these changes are reflected in the clinical picture. Lipman and his colleagues² state that the usual incubation period probably varies from four to twenty-one days. Vague complaints of malaise, chilliness, vertigo, headache and insomnia may precede the onset of fever. Physical examination often reveals an eschar at the site of the mite bite. Extensive adenopathy is common and is characteristic. The spleen is frequently but not invariably palpable. By the fifth to the eighth day of the disease the majority of patients have a maculopapular, erythematous rash, involving as a rule the lateral or anterior thorax or abdomen with the extremities least affected and the face not involved at all. The rash lasts about eight to twelve days. The febrile stage may persist up to four weeks, the average duration being seventeen days. Rapid breathing in severe cases accompanied by dyspnea is common. Altered respiratory symptoms with increased respiratory rate is usually out of proportion to the physical findings. The cardiovascular system is profoundly affected by the disease. The pulse rate is usually increased in uncomplicated cases but does not exceed 120 beats per minute; when it becomes more rapid it signifies a grave prognosis as a precursor of myocardial failure. Extrasystoles are common; a soft, blowing apical systolic murmur without any demonstrable clinical or x-ray evidence of cardiac enlargement is also common. In fulminating cases one or more of the following are usually noted: cyanosis, severe dyspnea, profound

1. Corbett, Austin J.: Scrub Typhus, Bull. U. S. Army M. Dept., November 1943.

2. Lipman, Bernard L.; Byron, Robin A., and Casey, Adrian V.: Clinical Survey of Scrub Typhus Fever, Bull. U. S. Army M. Dept., January 1944.

tachycardia, auricular fibrillation, gallop rhythm, pulsus alternans or cardiac dilatation. In 2 of the cases studied by Lipman and his colleagues death resulted from massive pulmonary emboli. Treatment is nonspecific. Military personnel with the disease should receive careful cardiovascular and electrocardiographic study before being returned to full or limited duty. The distribution of this disease in areas now being entered for the first time by our troops makes it imperative that its symptoms be kept clearly in mind.

INTRAVENOUS GELATIN

Hogan¹ in 1915 reported beneficial effects from intravenous injections of gelatin in 6 cases of shock. Hogan's report, according to Amberson, represents the first attempt to use a colloid for infusion. Although the method itself provoked little interest, it stimulated others to experiment with acacia. Because of renewed interest in blood substitutes and in parenteral nitrogenous nutrition, Brunschwig and his associates² attempted to determine in animal experiments and in man whether or not gelatin injected intravenously may be well tolerated and also to determine if gelatin remains inert in the organism or can be metabolized. They found in a limited number of clinical cases that gelatin is well tolerated when injected intravenously, that this tolerance extends to repeated, delayed injections and that hypersensitivity does not develop. They also observed that gelatin injected intravenously is at least partly catabolized, since increased urea nitrogen excretion usually obtains when such injections are made. The authors call attention to the fact that gelatin alone is not an adequate source of nitrogen for nutritional purposes because it does not include all essential amino acids. These experiments suggest that intravenous injection of gelatin may be utilized as a method of administering nitrogen. The authors warn, however, that gelatins vary widely in character, depending on the source and method of manufacture. Therefore the results reported cannot be applied to all types of gelatin.

ORAL VACCINES FOR COLDS

Recent communications to the offices of the American Medical Association indicate that the prescription and sale of cold vaccines is again taking place on a large scale. This, in the face of the recognized lack of scientific evidence for the value of these preparations, is indication of irresponsibility on the part of some manufacturers of pharmaceuticals. The scientific evidence against the value of oral cold vaccines is overwhelming; consequently individual physicians and firms who deal in pharmaceuticals and who lend themselves to wholesale uncontrolled distribution of such preparations are perpetrating an unwarranted commercial assault on the public pocketbook.

1. Hogan, J. J.: The Intravenous Use of Colloidal Solutions in Shock, *J. A. M. A.* **64**:721 (Feb. 27) 1915.
2. Brunschwig, Alexander; Scott, V. B.; Corbin, N., and Moe, R.: Observations on the Intravenous Injection of Gelatin for Nutritional Purposes, *Proc. Soc. Exper. Biol. & Med.* **52**:46 (Jan.) 1943.

PHYSIOLOGIC NONSENSE AND POLIOMYELITIS

Since the demonstration of the value of the treatment of poliomyelitis described by Miss Kenny, studies have been made in an attempt to explain the physiologic and pathologic conditions associated with the observed effects. The adherents of the Kenny theory have asserted that the harm of infantile paralysis is due to "spasm" of the affected muscles rather than to a flaccid paralysis. Qualified investigators¹ have shown that this is not the case. As stated recently by Cobb,² it is being demonstrated once more in the history of medicine that new and empirical methods of treatment backed by uncritical enthusiasm may produce many cures but much physiologic nonsense. The treatment may be good, but the ex post facto conclusions of the therapist are usually bad.

EMERGENCY MATERNITY AND INFANT CARE PROGRAM

In the Organization Section in this issue of *THE JOURNAL* appears a statement from the Children's Bureau of the United States Department of Labor indicating the regulations that have been prescribed for those rendering emergency maternity and infant care for the wives and babies of enlisted men. Simultaneously a leaflet has been mailed to every woman receiving dependency allowance informing her that wives of enlisted men are entitled to medical, nursing and hospital care as needed and available through pregnancy, childbirth and six weeks thereafter, that the infants are entitled to similar care until they are 1 year old and that the payments are made by state health departments directly to doctors and hospitals. The leaflet indicates further that the wife may apply for maternity care as soon as she knows she is pregnant and for care for her baby at any time by filling out an application which she gets from the doctor, hospital, clinic, health department, Red Cross chapter or the state health department. The doctor who is to give the care signs the application, which is then forwarded by either the wife or the doctor to the state health department. Services of a consulting physician as needed and available may be provided under the program. In the Organization Section of *THE JOURNAL* last week appeared an extended discussion of this subject before the Annual Conference of Secretaries and Editors of Constituent State Medical Associations. Some of the difficulties already apparent in the situation were emphasized. Many physicians expressed the fear that this was but the entering wedge for a government system of medical service. The appropriation under which this service is provided is distinctly an emergency war appropriation. Further modifications or extensions of this procedure should be considered by the medical profession in the light of their relationship to the practice of medicine now and in the future.

1. Moldaver, Joseph: Physiopathologic Aspect of the Disorders of Muscles in Infantile Paralysis, *J. A. M. A.* **123**:74 (Sept. 11) 1943.
Watkins, Arthur L.; Brazier, Mary A. B., and Schwab, R. S.: Concept of Muscle Dysfunction in Poliomyelitis, Based on Electromyographic Studies, *ibid.* **123**:188 (Sept. 25) 1943.
2. Cobb, Stanley: Review of Neuropsychiatry for 1943, *Arch. Int. Med.* **72**:795 (Dec.) 1943.

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeons General of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war, and such other information and announcements as will be useful to the medical profession.

ARMY

AVIATION MEDICINE

(Condensed from the Report of the Commanding General of the Army Air Forces to the Secretary of War)

One of the most important tasks of the Air Surgeon's office is setting the physical and psychologic standards for the selection of young men for flight training, and the proper classification of the men as bombardiers, pilots and navigators. This is accomplished by utilizing batteries of tests from which a combined aptitude score is obtained.

When an airplane goes from one theater to another it is carefully inspected so that it does not transport germs or disease-carrying insects.

Calculating the medical and dental supplies needed in all war theaters—for jungle, desert, mountain and arctic operations—is another task of the Air Surgeon. During the past fiscal year the Air Surgeon's office has coordinated the development and purchase of several hundred thousand aeronautic first aid kits, Navy type first aid kits for life rafts, airplane ambulance chests, and frying pan kits which are placed in the seat of the flier's parachute. The frying pan kits contain amphetamine for the temporary relief of fatigue, halazone for chlorinating water, atabrine for malaria, boric acid ointment for burns, sulfadiazine to prevent infection, iodine swabs, salt tablets, bandages, needle and thread, soap for washing, and tea tablets for a warming cup.

Still another task of the Air Surgeon is directing the air evacuation of wounded men. Since Pearl Harbor, over 125,000 casualties (sick, wounded and injured) have been flown from combat zones in American transport planes. This simple statement encompasses one of the greatest accomplishments of modern aviation medicine—an accomplishment of interest to every parent of a soldier in any branch of the Army.

The first obstacle that had to be surmounted in developing the air evacuation service was the supposed danger of killing the patient—estimated by some medical authorities to be a real one in the case of head, chest, spine and internal injuries. Yet the safety of transporting wounded by air has been demonstrated beyond doubt. In the Mediterranean theater from the beginning of the Tunisian campaign in November 1942 to the close of the Sicilian campaign in September 1943 more than 25,000 men with all types of illnesses and wounds were transported 8,000,000 miles by air. Only 1 patient died, 1 in 25,000.

The second obstacle was the shortage of air transports. Airplanes, it was said, could not be spared solely for such purposes. This obstacle was surmounted by the simple conversion of cargo planes carrying troops and supplies to the front to the transportation of patients on the return trip to the rear. Air evacuation is a boon to the morale of ground troops and aids the theater commander by quick removal from the battle zone of his noneffectives. Trips which would take weeks by hospital train or ship are now flown, in a day. Air evacuation is an impressive example of successful cooperation among Army air, ground and service forces.

Flight nurses are carefully selected and trained in phases of aerial medicine, intravenous therapy, tropical medicine, field sanitation, compass, map and aerial photography orientation, what to do in case of air and gas attacks, and other matters. The lives of the men may depend on the proficiency of a flight nurse. Besides looking after the comfort and needs of the sick and wounded men the nurse can also be helpful in maintaining the high morale. Each patient requires individual attention. The nurses of the Army Air Forces have met the tests of battle in a manner to merit unqualified approval.

Complete hospital service now moves with the mobility of war itself. Six days after the Army hospital in Nome, Alaska, burned down a new and complete 25 bed hospital had been flown in from a distance of 3,400 miles. Two field hospitals were flown over the Owen Stanley Mountains in New Guinea. In Sicily a 50 bed hospital was moved by air a distance of 44 miles in two and one-half hours from the time it was dismantled until the time it began receiving patients at the new site.

In designing P-47 Thunderbolt fighters, which maneuver at 400 miles an hour, and Flying Fortress bombers, which can climb to 40,000 feet altitude, aeronautical engineers have carried aircraft performance far beyond the natural tolerance limits of the human body. To make their planes humanly as well as technically practicable the engineers have formed a close partnership with medical scientists.

The main oxygen engineering achievement of the last two years has been the production of the demand type oxygen system, replacing the continuous flow type still found in the older planes. The demand system automatically supplies the flier the amount of oxygen he needs at any altitude up to 40,000 feet. All flying personnel are given indoctrination in the use of oxygen by high altitude training units equipped with low pressure chambers. These units make simulated flights to 38,000 feet, and the necessity of rigid oxygen discipline at high altitudes is made clear to every airman.

Constant research is being done on flying fatigue. Rest camps have been established in theaters of operation and in the United States. In all our active units the flight surgeons keep a close eye on all personnel to discover those men who need a change or rest before the severe demands of combat flying result in serious psychologic maladjustments.

The Convalescent Training Program, which was begun with our men in training, is now being extended to fliers overseas. It stems from a program carried out in the 239 Army Air Force hospitals in this country during the past year. The rehabilitation program includes physical exercises, which may begin in bed and end with outdoor games, and educational pursuits of a vocational or military nature. About 2,500,000 man hours each month are devoted to such activities in the Army Air Forces.

With the intention of achieving equal results in the rehabilitation of the wounded, sick and war weary men, the Army Air Forces are establishing seven rehabilitation centers in the United States. Every known facility is being used to aid these physically and psychologically wounded soldiers to make a new place for themselves in military or civilian life. Our interest and responsibility do not stop at the moment our men drop their bombs on the target.

SHARP INCREASE IN RESPIRATORY DISEASES IN THE ARMY

The War Department recently announced a sharp increase in respiratory diseases in the army similar to that reported among the civilian population of the United States, beginning about November 20 in the Sixth Service Command, which includes the states of Illinois, Wisconsin and Michigan. Current reports, however, indicate that the epidemic is subsiding in this area, but in the South and Southwest, where the outbreak came more recently, the incidence continues to rise.

There has been no increase in the number of cases of pneumonia, and only one death due to influenza has been reported. There were 48,490 cases of common respiratory infections,

including influenza, reported in the army in the continental United States during the week ended December 4, and approximately 150,000 cases during the week of December 11, which compares favorably with the incidence rate reported among the civilian population. The medical department of the army, aided by the Board for the Investigation and Control of influenza, is carefully watching the situation. The Influenza Commission of the board has established laboratories at strategic points throughout the country to observe epidemics, check for the presence of the true influenza virus and inform the Office of the Surgeon General. The War Department has already made plans to assist in furnishing emergency hospitalization, drugs and medical care to stricken areas in the event of an influenza epidemic of really serious proportions.

PROCUREMENT AND ASSIGNMENT SERVICE FOR PHYSICIANS, DENTISTS AND VETERINARIANS

FEDERAL FUNDS FOR RELOCATION OF PHYSICIANS

Preliminary steps have been taken to make effective the authority recently granted by Congress to the Public Health Service to provide financial aid to civilian physicians who will agree to relocate to critical areas. Herewith is reproduced a letter sent to all state health officers by the service, under date of January 12, concerning the program. A similar letter has been sent by the Central Office, Procurement and Assignment Service, to all state chairmen of the Procurement and Assignment Service. It is understood that the details of the program will be worked out in the near future. The letter follows:

"Public Law #216, 78th Congress, approved by the President on December 23, 1943, appropriates to the United States Public Health Service the sum of two hundred thousand dollars (\$200,000) during the fiscal year ending June 30, 1944 for the relocation of private practicing physicians and dentists. This act provides in part as follows:

"Provided, That the Surgeon General is authorized on application of a municipality, county or other local subdivision of government duly approved by the state health department having jurisdiction over said municipality, county or other local subdivision of government to enter into agreements with private practicing physicians and dentists under which, in consideration of the payment to them of a relocation allowance of not to exceed \$250 per month for three months and the actual cost of travel and transportation of the physician or dentist and his family and household effects to the new location, such physician or dentist will agree to move to and engage in the practice of his profession in such area for a period of not less than one year; Provided, however, that no such contract shall be made with any physician or dentist unless such physician or dentist shall be admitted to practice by the state authority having jurisdiction of such new location; Provided, further, That each such applicant subdivision shall contribute 25 per centum to the total cost of such relocation allowance, travel and transportation costs of each such physician or dentist and his family obtained by said applicant."

"It is to be noted that this act provides:

"1. That a municipality, county or other local subdivision of government may submit an application to the Surgeon General for the relocation of a private practicing physician or dentist in the applicant subdivision.

"2. That such application must be duly approved by the State Health Department having jurisdiction over said municipality, county or other local subdivision of government.

"3. That the Surgeon General on receiving such application is authorized to enter into an agreement with a private practicing physician or dentist under which, in consideration of a relocation allowance of not to exceed \$250 per month for three months and the actual cost of travel and transportation of the physician or dentist and his family and household effects to the new location, such physician or dentist agrees to move to and engage in the practice of his profession in the applicant subdivision for a period of not less than one year.

"4. That no such contract shall be made with any physician or dentist unless such physician or dentist shall be admitted to practice by the state authority having jurisdiction of such new location.

"5. That each such applicant subdivision shall contribute 25 per centum to the total cost of such relocation allowance, travel and transportation costs of each such physician or dentist and his family obtained by such applicant.

"The State Procurement and Assignment Service has already determined that certain areas in your state are in need of additional physicians and/or dentists. A list of such areas is

ARMY PERSONAL

Col. Manfred U. Prescott, formerly of San Francisco, has been appointed post surgeon and senior medical officer at the Scott Field (Illinois) Army Air Forces Training Command radio school. He will succeed Col. Edwin L. Brackney, who has been transferred to another base. Dr. Prescott graduated from the University of Illinois College of Medicine in 1923 and for the next five years practiced medicine in Chicago and taught anatomy and surgery at the University of Illinois. He joined the medical reserve as a lieutenant in 1925 and was promoted to captain in 1929 and to major in 1935. He was called to active duty with the Army in June 1941 with the rank of lieutenant colonel.

attached. It will be helpful to the Public Health Service if you, in consultation with state chairman, Procurement and Assignment Service, will reexamine these areas as to their present status. If the need exists it is suggested that you rate them in order of urgency. Possibly the areas listed do not include all the needy communities in your state and others may have been brought to your attention which should be added.

"While the state health officer must approve the application from any community made under this act, the State Procurement and Assignment Service chairman has the responsibility of determining which physicians (or dentists) are available for relocation.

"Detailed information together with application forms for use by subdivisions wishing to apply for the relocation of physicians and dentists will be forwarded to you in the near future.

"Similar letters are being sent by the Central Board, Procurement and Assignment Service, to the chairmen of the State Procurement and Assignment Service advising them of the availability of these funds for relocation purposes.

"Your cooperation is solicited in bringing this legislation to the attention of eligible communities."

HOSPITALS NEEDING INTERNS AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their house staff quotas allotted by the Procurement and Assignment Service:

(Continuation of list in THE JOURNAL, January 15, p. 167)

MASSACHUSETTS

Memorial Hospital, Worcester. Capacity, 215; admissions, 7,347. Dr. Winthrop B. Osgood, Superintendent (2 interns).

NEW JERSEY

Holy Name Hospital, Teaneck. Capacity, 226; admissions, 4,843. Dr. F. C. McCormack, Medical Director (5 interns).
St. Mary's Hospital, Orange. Capacity, 160; admissions, 3,742. Sister M. Antoinette, Superintendent (interns).

NEW YORK

Jewish Hospital, Brooklyn. Capacity, 661; admissions, 13,892. Dr. M. Hinenburg, Executive Director (assistant resident—pathology).

NORTH CAROLINA

Watts Hospital, Durham. Capacity, 225; admissions, 5,821. Mr. Sample B. Forbus, Superintendent (residents—medicine, urology).

OHIO

Good Samaritan Hospital, Dayton. Capacity, 350; admissions, 7,999. Sister Frances Maria, Administrator (2 interns, 2 residents).

PENNSYLVANIA

Mercy Hospital, Altoona. Capacity, 180; admissions, 3,867. Mother M. Otillia, Superintendent (interns).
South Side Hospital, Pittsburgh. Capacity, 225; admissions, 5,227. Miss Gertrude L. Heatley, R.N., Superintendent (interns).

TENNESSEE

Nashville General Hospital, Nashville. Capacity, 305; admissions, 6,138. Mr. W. Dortch Wood, Hospital Administrator (3 interns, 1 resident—medicine).

WASHINGTON

Pierce County Hospital, Tacoma. Capacity, 239; admissions, 2,776. Dr. Burton A. Brown, Medical Superintendent (interns).

MISCELLANEOUS

RECOMMENDATIONS OF NATIONAL
RESEARCH COUNCIL RESTRICT-
ING USE OF QUINIDINE

An acute shortage of quinidine exists in the United States today, and possibilities for replacement of present supplies are negligible. It is imperative, therefore, to reduce the use of this important drug and to limit its employment to the treatment of certain cardiac arrhythmias in which experience has shown it to be of special, often critical, value. The problem of conserving supplies of quinidine has been studied by the Committee on Drugs and Medical Supplies of the National Research Council and its Subcommittee on Essential Drugs and by the Committee on Medicine and its Subcommittee on Cardiovascular Diseases. The following recommendations have been made:

It is recommended that quinidine be limited to the treatment of heart disease on prescription of a person licensed to practice medicine and surgery in the state. That this quinidine is to be used for the treatment of heart disease should be certified by the prescribing physician.

It is further recommended that quinidine should not be combined with other drugs and prepared fixed formulas.

Criteria for the use of quinidine during the period of shortage should be limited to:

1. Ventricular tachycardia diagnosed electrocardiographically.
2. Congestive heart failure that appears definitely to have been precipitated by the sudden onset of auricular fibrillation (if not adequately controlled by digitalis).
3. Persistent premature ventricular contractions in patients who have had acute coronary artery occlusion.
4. Chronic disease of the heart associated with paroxysmal auricular fibrillation, paroxysmal auricular tachycardia or auricular flutter.
5. A history of systemic embolization in a case of paroxysmal or established auricular fibrillation.

Prescription of quinidine should be limited to not more than fifty 3 grain tablets for any acute attack of arrhythmia fulfilling one of the foregoing criteria, and to not more than thirty 3 grain tablets per week for the purpose of maintaining sinus rhythm after quinidine has reestablished it.

WARTIME GRADUATE MEDICAL
MEETINGS

Additional subjects and speakers for Wartime Graduate Medical Meetings have just been announced:

At Camp Shanks, Orangeburg, N. Y.: Management of Peripheral Nerve Injuries, Dr. Bronson S. Ray, March 2; Treatment of Anorectal Diseases in the Army, Dr. Frank C. Yeomans, March 16; Fractures, Dr. Clay Ray Murray, March 30.

At Camp Upton, New York: Disordered Action Heart, Dr. B. S. Oppenheimer, February 7; Deficiency States and Their Recognition, Dr. H. D. Kruse, February 14.

At the Mason General Hospital, New York: Disordered Action Heart, Dr. B. S. Oppenheimer, February 7; Deficiency States and Their Recognition, Dr. H. D. Kruse, February 14.

PERSONNEL NEEDED

The Budget Bureau, after due consideration of the growing seriousness of personnel shortages at the Veterans Administration, has granted the veterans' agency an A-1 personnel priority so as to increase its ability to meet growing activities caused by war conditions and loss of personnel. This action of the Budget Bureau places the Veterans Administration in the same priority category as the War and Navy departments in ability to recruit personnel which are necessary to meet present shortages and to permit the expansion required by its growing obligations to the veterans and their families.

The Veterans Administration with increased responsibilities has lost over 6,200 of its personnel to the armed forces—more than 25 per cent of the male employees—in spite of its greater volume of work, caused by the discharge of men from the armed services. General Hines expressed the hope that thousands of veterans who have been discharged from service in the present

war will apply for the vacant jobs, thus rendering assistance to their comrades and families. About 1,000 such veterans have already been appointed in the Veterans Administration, but there is need for many more. An expansion of rating boards, which determine the character of a veteran's disability and make the award of pensions, has been in progress for some time. Doctors, rating specialists and occupational specialists are needed for key positions on these boards.

There has been an acute shortage in hospital attendants, making necessary the detail of more than 1,000 soldiers from the Army to aid in meeting this emergency. Stenographers and clerical workers are also in great demand. Applications for jobs outside Washington should be made to the manager of the nearest Veterans Administration Facility or field station.

CHANGE IN MAIL RULES FOR
PRISONERS OF WAR

Parcels for prisoners of war held in camps in this country should be addressed to the camps, according to Ernest J. Kruetgen, Chicago postmaster. In the past they have been addressed "Via New York."

Letters or cards to camps either in this country or in enemy occupied countries should be continued to be addressed to New York. Postmaster Kruetgen also said that when the name of the addressee is near the top of the envelop the cancellation may obliterate the writing. The addressee's name and address should be placed in the lower right hand portion of the envelop.

Air mail service to prisoners of war in Europe is available at the rate of 30 cents for each half ounce or fraction. This does not include Italy, where no service is available.

OPA ANNOUNCES NEW CEILING PRICES
OF EAR AND ULCER SYRINGES

The Office of Price Administration announced recently reductions in the ceiling prices of ear and ulcer syringes and double end bulbs made of neoprene. Previously all neoprene double end bulbs and ear and ulcer syringes had differentials of natural rubber bulbs of 5 cents each, regardless of size. The new differentials are 3 cents each for such bulbs and syringes under 3 ounces in size, and 4 cents for the 3 ounce size. The differential of 5 cents each is continued for the 4 ounce size of these bulbs. These prices will remain in effect until June 30, 1944.

HEALTH UNDER HITLER

It is reported from Paris that Scapini has given details to the press concerning the replacement of doctors, dentists and chemists in prisoners' camps which started in July 1942, according to the November 13 Vichy Home Service. More than 500 members of the three professions have already gone to Germany, in part replacement of 900. The return of those sent a year ago, to replace their comrades, has to be provided for. Because of these difficulties the authorities have decided to appeal to the Corps de Santé civil to complete the replacement. This corps numbered 30,000 practitioners before the war and can offer efficient help in this work of comradeship. Emphasis was laid on the moral character of this undertaking.

L'Action française of Nov. 20, 1943 (France) states that, after long research, Borsakovski, an engineer, succeeded in incorporating into wheat flour an intermediate husk, very rich in vitamins, diastases and mineral salts, the separation of which from the outer purely cellulose, valueless and indigestible husk has been up till now impossible. Despite present difficulties Jean Couturier, a miller at Montbrisen (Loire), has altered existing equipment and installed new machines. The new flour, which is 97 per cent assimilable, gave excellent results in sanatoriums on a feeding up diet. By decision of the minister of health, the flour thus produced by Couturier is reserved for hospitals, maternity homes and sanatoriums pending large scale manufacture.

ORGANIZATION SECTION

OFFICIAL NOTES

SIXTH ANNUAL CONGRESS ON INDUSTRIAL HEALTH

The sixth Annual Congress on Industrial Health, sponsored by the Council on Industrial Health of the American Medical Association, will be held Tuesday and Wednesday, February 15 and 16, at the Palmer House in Chicago. This meeting follows directly after that of the Congress on Medical Education and Licensure. Physicians and others interested in industrial health are cordially invited. There is no registration fee. The preliminary program is as follows:

TUESDAY, FEBRUARY 15—OPENING SESSION, 10 A. M.

Report of the Council on Industrial Health

STANLEY J. SEEGER, M.D., Chairman, Texarkana, Texas

Industrial Health—A Restatement of Objectives

JAMES E. PAULLIN, M.D., Atlanta, Ga.

President, American Medical Association

Preventive Medicine—Its Importance in Medical Education and Practice

JAMES STEVENS SIMMONS, Brigadier General, M. C., Washington, D. C.

Chief, Preventive Medicine Division of Office of Surgeon General, U. S. Army

Panel—Postwar Industrial Health

Moderator—R. L. SENSENICH, M.D., South Bend, Ind.

Participants:

HARVEY BARTLE, M.D., Philadelphia

Council on Industrial Health

President, American Association of Industrial Physicians and Surgeons

SIDNEY R. GARFIELD, M.D., Oakland, Calif.

Permanent Foundation Hospital

W. P. JACOB, Long Island City

National Association of Manufacturers

NEVILLE PILLING, Chicago

Zurich Insurance Companies

J. G. TOWNSEND, M.D., Bethesda, Md.

U. S. Public Health Service

ROBERT J. WATT, Washington, D. C.

International Representative, American Federation of Labor

BALLROOM

TUESDAY—AFTERNOON SESSION, 2 O'CLOCK

New Developments in Occupational Medicine—Aviation

DAVID N. W. GRANT, Major General, Washington, D. C.

The Air Surgeon, U. S. Army

An Institute of Industrial Health—Plans of a Proposed Development in the Medical Science Center of Wayne University

EDGAR H. NORRIS, M.D., Detroit

Dean, Wayne University College of Medicine

A Visual Service for Small Manufacturing Plants

HARRY S. GRADLE, M.D., Chicago

Medicine, Labor and Industry Join Hands in Philadelphia

CHARLES-FRANCIS LONG, M.D., Philadelphia

Chairman, Commission on Industrial Health and Hygiene, Medical Society of the State of Pennsylvania

The Conquest of Tuberculosis in Industry

HERMAN E. HILLEBOE, Washington, D. C.

Senior Surgeon, Medical Officer in Charge, Tuberculosis Control Section, States Relations Division, U. S. Public Health Service

BALLROOM

TUESDAY—EVENING SESSION, 6:30 O'CLOCK

STATE SOCIETIES DINNER AND ROUND TABLE

An informal dinner and round table discussion intended primarily for the personnel of committees on industrial health in state and county medical societies, will be held.

CRYSTAL ROOM

WEDNESDAY, FEBRUARY 16—MORNING SESSION,

9:30 O'CLOCK

The New Movement in Industrial Sanitation

•MOHE E. SOLWORTH, Louisville, Ky.

Sanitation Consultant

Health Education for Industrial Workers

W. W. BAUER, M.D., Chicago

Director, Bureau of Health Education, A. M. A.

Maladjustment in Industry

FRANK F. TALLMAN, M.D., Lansing Mich.

Director of Mental Hygiene, State Hospital Commission

The Story of Penicillin

CHESTER S. KEEFER, M.D., Boston

Chairman, Committee on Chemotherapy and Other Agents, Division of Medical Sciences, National Research Council

The Detection and Treatment of Malnutrition Among Industrial Workers

TOM D. SPIES, M.D., Cincinnati

Associate Professor of Medicine, University of Cincinnati College of Medicine

BALLROOM

WEDNESDAY, FEBRUARY 16—MORNING SESSION, 9:30 O'CLOCK

SYMPOSIUM ON MEDICAL SERVICE UNDER WORKMEN'S COMPENSATION

Medical Developments in Workmen's Compensation—1943

J. W. HOLLOWAY JR., Chicago

Director, Bureau of Legal Medicine and Legislation, A. M. A.

The Interdependent Problems of the Administrator and the Industrial Physician

MRS. EMMA SANBORN TOUSANT, Boston

President, International Association of Industrial Accident Boards and Commissions

Disability Evaluation—The Solution in Wisconsin

VOYTA WRABETZ, Madison, Wis.

Chairman, Industrial Commission of Wisconsin

Is the Present System of Occupational Disease Coverage Adequate?

RUTHERFORD T. JOHNSTONE, M.D., Los Angeles

Second Injury Funds

J. DEWEY DORSETT, New York City

Assistant General Manager, Association of Casualty and Surety Executives

Supervising Standards of Medical Service for the Injured Workman

D. J. GALBRAITH, M.D., Toronto

Vice Chairman, Ontario Workmen's Compensation Board

CRYSTAL ROOM

WEDNESDAY—AFTERNOON SESSION, 2 O'CLOCK

SYMPOSIUM ON THE REHABILITATION AND REEMPLOYMENT OF THE DISABLED

The Present Status of Rehabilitation in the U. S. Army

FRED W. RANKIN, Brigadier General, U. S. Army, Washington, D. C.

Chief Consultant in Surgery

W. E. BARTON, Major, M. C., Washington, D. C.

Director, Reconditioning Division

Vocational Training and Placement of the Veteran

FRANK T. HINES, Brigadier General, Washington, D. C.

Administrator, Veterans Administration

State Plans for Rehabilitation

MICHAEL J. SHORTLEY, Washington, D. C.

Director, Office of Vocational Rehabilitation, F. S. A.

The Place of the Compensation Insurance Carrier in the Field of Rehabilitation

B. E. KUECHLE, Wausau, Wis.

Vice President and Claim Manager, Employers Mutual Liability Insurance Company of Wisconsin

Current Developments Affecting the Physician's Role in Manpower Utilization

CLIFFORD KUH, M.D., Richmond, Calif.

Permanent Hospitals, Kaiser Shipyards

BERT HANMAN, San Francisco

Regional Staff, War Manpower Commission

Community Organization for Rehabilitation and Reemployment

HAROLD VONACHEN, M.D., Peoria, Ill.

Medical Director, Caterpillar Tractor Company

BALLROOM

WEDNESDAY—AFTERNOON SESSION, 2 O'CLOCK

SYMPOSIUM ON WOMEN IN INDUSTRY

(Arranged by the Committee on the Health of Women in Industry, Section on Obstetrics and Gynecology, American Medical Association)

Report of the Committee on the Health of Women in Industry

H. CLOSE HESSELTINE, M.D., Chicago

Chairman, Committee on Health of Women in Industry

Protection for Industrial Women—Progress and Prospects

MISS MARY ANDERSON, Washington, D. C.

Director, Women's Bureau, U. S. Department of Labor

Why Do Women Stay Away from Work?

C. O. SAPPINGTON, M.D., Dr.P.H., Chicago

Industrial Health Consultant

A Practical Industrial Health Program for Women

FRED B. WISHARD, M.D., Anderson, Ind.

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Discussion Leaders:

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CRYSTAL ROOM

EMERGENCY MATERNITY AND INFANT CARE PROGRAM

Statement of Administrative Policies

The following statement of administrative policies, as revised in December 1943, has been prepared by the Children's Bureau for the information of the state health agencies administering emergency maternity and infant care programs and of individuals or other agencies concerned with the provision of services under this program.

The Children's Bureau will use these policies as the basis for approval of the related portions of state emergency maternity and infant care plans for the fiscal year 1945, and of revisions, amendments or supplements to emergency maternity and infant care plans received during the remainder of the fiscal year 1944. State health agencies may amend their emergency maternity and infant care plans now or at any time during the current fiscal year in accordance with these revised policies.

The administrative policies of the Children's Bureau have been developed within the framework of the Congressional acts and the regulations of the Secretary of Labor, and in accordance with the intent of Congress as shown by the legislative history and interpreted by the bureau and by the Solicitor of the Department of Labor. In the light of the experience of the state health agencies and with the advice of the bureau's professional advisory committees, many modifications of policy have been made. Recommendations made at the conference of official representatives of the servicemen and of medical organizations, held at the Children's Bureau on Dec. 10 and 11, 1943, have been considered carefully in reaching decisions as to these policies. A supplemental statement of policy will be issued on health supervision of infants after further conferences with administrative agencies (see Note, Health Supervision of Infants) and, as experience indicates, on other subjects.

I. INDIVIDUALS FOR WHOM EMIC SERVICES MAY BE AUTHORIZED

1. Any woman applying for care whose husband, at the time of initial application,¹ was in the 4th, 5th, 6th or 7th pay grade of the United States Army, Navy, Marine Corps or Coast Guard (including enlisted men in these grades who are deceased or missing in action).

2. Any infant under 1 year of age for whom an application¹ is made whose father at the time of application was in the 4th, 5th, 6th or 7th pay grade of the United States Army, Navy, Marine Corps or Coast Guard (including men in these grades who are deceased or missing in action).

II. CONDITIONS UNDER WHICH SERVICES MAY BE AUTHORIZED

1. The individual for whom services are authorized is the wife or infant of an enlisted man in the 4th, 5th, 6th or 7th pay grade of the armed forces of the United States.

2. There shall be no financial investigation or means test to determine eligibility as a condition of receiving any service provided under the EMIC program.

3. Similar service is not readily available (without financial investigation and without cost to the patient) from the medical personnel or hospitals of the United States Army, Navy or Public Health Service or from clinics or conferences or other services provided by or through state or local public health agencies or services available under state crippled children's programs.

4. The wife of an enlisted man may have free choice under the program of all types of available facilities and services, including private practitioners, clinics, hospitals and other health facilities that meet the standards established under a state plan for each type of service or facility.

5. The attending physician has the qualifications, and the hospital meets the standards established under the state plan.

6. The attending physician or clinic has agreed to accept payment only from the state health agency for whatever medical or surgical services he renders during pregnancy, labor and six weeks post partum or for the care of an infant for which

authorization has been issued under the state program. (See section IV for types of service that may be authorized.)

7. The hospital, if hospital care is requested, has agreed to accept payment only from the state health agency for services rendered during a period of authorized hospital care under the program and will agree to provide at least ten days' care following delivery if accommodations are available and if the patient wishes to remain in the hospital.

8. The hospital will provide whatever accommodations are indicated by the patient's medical condition at the per diem-rate paid by the state health agency.

9. Physicians' services will not be authorized if the patient or some one in behalf of the patient is to pay for hospital care; and hospital care will not be authorized if the patient or some one in behalf of the patient is to pay the physician for medical care.

10. The cost of medical services in a clinic and/or hospital, including maintenance and salaries, where such medical service is provided by staff physicians (such as interns, resident staff and attending physicians employed full time or part time by the clinic or hospital or other physicians supervising or assisting interns or resident physicians) must be included in the cost per clinic visit and the hospital cost per patient day as outlined in the Children's Bureau memorandum of Sept. 1, 1943, "Purchase of Hospital Care Under Programs for Maternal and Child Health and Crippled Children."

11. Individuals accepted for care under the program will be referred routinely to local public health agencies for the provision of public health-nursing services that can be made available.

12. Arrangements will be made to utilize community facilities, including appropriate social and health agencies, to meet the needs of mothers and infants that cannot be provided under the EMIC program.

DISCUSSION

The emergency maternity and infant care program has been established to provide maternity and infant care to the wives and infants of enlisted men in the four lower pay grades regardless of where they are living, through the development of an organized plan, under the jurisdiction of the state health agency, with a view to making the care provided under the Congressional act available and accessible to all wives who wish to apply for their own care or care of their infants.

The emergency maternity and infant care program is to supplement and not to replace existing facilities for care, which may be available without cost and without financial investigation to enlisted men's wives or infants.

The Congress has made it clear that the care is to be provided as a service to which the wife and infant of an enlisted man are entitled without financial investigation, and that the program is intended to provide the care, if requested by or for the wife or infant of any enlisted man in the four lower pay grades, in order to relieve the enlisted man and his wife of any uncertainty as to how the cost of care will be met and to assure them that care will be provided.

The quality of care should be the best available. To help accomplish this the state health agencies must establish standards for the selection of physicians, nurses, hospitals and clinics providing care, make available consultation services by specialists and other special services, wherever available, and endeavor in every manner possible to maintain recognized high standards of care for mother and child. Quality of care implies that the fullest possible consideration be given to the needs of each patient and that all community resources be mobilized to meet social as well as medical needs.

In order to relieve the enlisted man and his wife of all anxiety with regard to how the cost of care will be met, the state agency, when authorizing medical or hospital care, assumes full responsibility for the payment for such services in accordance with the rates established under the program.

If a physician were to request authorization for hospital care under the program and arrange with the patient to pay him for her medical care, or if he were to request authorization for medical care when the patient is to pay for hospital care, or if a physician or hospital were to charge the patient an amount in addition to that paid by the state agency, it would nullify the Congressional objective of providing care without cost to the enlisted man or his family.

1. If an enlisted man in one of the four lower pay grades, for whose wife or infant application for care has been made, is discharged or promoted after the date of application, or his wife or infant moves to another state or changes physicians, his wife or infant can continue to receive services available under the plan. For purpose of eligibility, the date of application is the date when an application for care is received by the state (or local) health agency, whether on official forms or by letter or by telephone. If application was made by telephone, the date of application is the date when such application was made according to the records of the state (or local) health agency.

III. APPLICATION AND AUTHORIZATION FOR CARE

A. *Application for Care.*²—1. For Maternity Care: Since the wife is entitled, under the program, to complete maternity care, application for care should be made by her or in her behalf as early in pregnancy as possible, directly to the state or local health agency on forms provided for the purpose, or, in an emergency, by letter or telephone.

2. For Infant Care: Similarly, application for care of the infant should be made by the mother, or other person in behalf of the infant, as soon as medical care is needed, preferably at the first visit to physician, clinic or hospital.

NOTE.—On receipt of the application, whether complete or incomplete, the state (or local) health agency should assume responsibility for planning for local services and care as needed by the applicant.

DISCUSSION

The Emergency Maternity and Infant Care Program is not simply the payment for services needed but a plan whereby the state and local health agencies assist the families of enlisted men in obtaining the medical, nursing, hospital and other services needed for maternity care of their wives and medical care of their infants, seeking the support of all community resources in meeting these needs and maintaining the highest possible standards of care. Many of these families are unfamiliar with the resources for health and other services in the community in which they are now residing. The earlier the state and local health agencies are aware of the needs of each of these families, the better they can assist them in obtaining services needed. Early application for maternity care is therefore desirable, and every possible means should be used to inform the public about the program and to encourage wives and physicians to get applications in early.

B. *Authorization for Care.*—1. For Maternity Care: The wife should enter on the application form the date during pregnancy when she first requested care under the emergency maternity and infant care program from this physician, clinic or hospital.

The physician's statement on the application blank constitutes a "request for authorization" for the care outlined by him on the blank. Whenever possible the blank should be filled in and dated at the visit when the wife first applies to him for care under the program. The physician should check, if possible, the husband's serial number and military rank or rating, as entered on the patient's part of the form with her allowance card, letter or other information.

The wife should be responsible for sending the completed blank to the state (or local) health agency.

The "effective date of authorization" (the date from which the state health agency assumes responsibility for payment for services) shall be: The date during pregnancy when the wife first requested care under the emergency maternity and infant care program from physician, clinic or hospital; provided the application, signed by the physician, is received by the state or local health agency within six weeks after the date when the wife first requested care under the program. If not received within six weeks after the wife first requested care under the program, the "effective date of authorization" shall be a date not more than six weeks prior to the date when the application, signed by the physician, was received in the state (or local) health agency.

In cases in which the wife has made one or more visits to the physician, clinic or hospital before she requests care under the program, and the application, signed by the physician, is received by the state health agency late in the wife's pregnancy, the "effective date of authorization" may be an earlier date than has been defined to cover previous visits, provided a statement is submitted to the state (or local) health agency in writing that (1) establishes an acceptable reason for delay in application, such as misinformation, misunderstanding of procedure or other valid reason, (2) indicates the amount of care pre-

2. Application blanks and full information about the program should be available readily in physicians' offices, clinics, hospitals, Red Cross chapters, local health and welfare agencies, and from local public health nurses. Application blanks have two parts: (1) the wife's statement and (2) the physician's statement. On obtaining a blank the wife should fill out her part, take it to a physician (in office or clinic) and ask him to fill out his part. She should then send it herself immediately to the state (or local) health agency. The date when the application, including the physician's statement, is received at the state (or local) health agency is important in establishing the date when the cost of care is assumed by the state health agency. However, even though prompt completion of the application is important, the wife should not delay sending in her part of the application if for some reason the physician's statement cannot be filled out at once or other information cannot be obtained. In this case a second application blank must be used by the physician when he fills out his request for authorization.

viously given and (3) shows that no payment has been made to the physician by or in behalf of the wife for care during the period covered by the authorization.

Application for delivery care received after the date of delivery should be approved for authorization only when supported by information indicating a medical emergency, such as a premature delivery, or a situation beyond the control of the patient, such as delay in mails, misunderstanding of procedures, misinformation or other valid reason.

2. For Infant Care: The physician's statement on the application blank constitutes his request for authorization to give care to the infant as outlined by him on the blank. The blank should be filled in and dated during, or as soon as possible after, the first visit of, or to, a sick infant. The physician should check, if possible, the husband's serial number and military rank or rating, as entered on the patient's part of the form, with her allowance card, letter or other information.

The mother, or other person applying in behalf of the infant, should be responsible for sending the completed blank to the state (or local) health agency.

The "effective date of authorization" for medical care of a sick infant shall be the date when the physician or clinic or hospital agreed to give care for the present illness, provided it is not more than ten days prior to the date when the application was received in the state (or local) health agency.

3. Emergency Care: In case of emergency, authorization for care of wife or infant may be given, provided request for authorization of such services is received by letter, telephone or telegraph within a reasonable interval of time, as defined by the state health agency, after the occurrence of the emergency.

IV. SERVICES THAT MAY BE AUTHORIZED BY STATE OR LOCAL HEALTH AGENCIES AND RATES OF PAYMENT

A. *For the Wife.*—1. Medical and Surgical Services Provided by Physicians in Private Practice:³ This includes services to a patient who has sought and received care in the private office of a physician during the antepartum period. For this type of care, payment is to be made directly to the physician by the state health agency.

It also covers services to a patient who has sought and received care in the private practice of a physician employed full time or part time by a medical school, for which payment may be made to the medical school or to the physician depending on the customary procedure for receipt of such payments.

a. Complete maternity care: For "complete maternity care," that is, all services rendered by the attending physician: (1) to the mother during pregnancy, labor and the postpartum period from the effective date of authorization until six weeks after termination of pregnancy, including office treatment of intercurrent conditions whether attributable to pregnancy or not, but excluding home or hospital care of conditions not attributable to pregnancy (as outlined under b and c) and (2) to the infant during the first two weeks of life: The rate of payment as established by the state health agency, but not to exceed \$50.

When fewer than seven antepartum examinations are made, when no postpartum examination is made or when other services recognized as part of routine complete maternity care are omitted, the rate of payment for complete maternity care is to be adjusted to cover only the services actually rendered. When an obstetrician refers an infant to a pediatrician for routine care during the first two weeks of life, no reduction need be made in the rate of payment to the obstetrician for "complete maternity care."

In exceptional cases additional payments for attending physicians' services may be authorized by the state (or local) health agency for continuing care of the mother beyond six weeks post partum for a serious, acute complication resulting from pregnancy, such as puerperal infection.

(For rates of payment see item c).

b. Major nonobstetric intercurrent surgical operations: Additional payments may be authorized by the state (or local) health agency to attending physicians who qualify as consultants (for qualifications of consultants see section IV, 2) in a surgical specialty, for major, nonobstetric surgical operations needed during pregnancy and six weeks post partum for conditions not attributable to pregnancy (such as appendectomy during pregnancy) at a rate established by the state health agency not to exceed a total of \$50 for preoperative, operative and postoperative care.

c. Medical care of other intercurrent nonobstetric conditions: Additional payments for attending physicians' services (for a period of three weeks with review by the state or local health agency before authorizing an extension of care) may be authorized by the state (or local) health agency during pregnancy

3. For services of consulting specialists, see section C, item 1.

and six weeks post partum for the home or hospital treatment of intercurrent conditions not attributable to pregnancy, which do not require major surgery at weekly rates of payment for medical care as established by the state health agency, but not to exceed \$12 for the first week of illness and, if fewer than four home or hospital visits are made during the week, proportionate payment to be made for services rendered; for succeeding weeks of illness not to exceed \$6 a week, and, if fewer than three home or hospital visits are made during a week, proportionate payment to be made for services rendered.

d. Antepartum care only, or spontaneous abortion: When only antepartum care is provided by the attending physician, at a rate of payment established by the state health agency but not to exceed \$15 for care during the antepartum period. If fewer than seven antepartum visits are made, proportionate payment to be made for services rendered.

If pregnancy terminates in spontaneous abortion not requiring an operation, at a rate of payment not to exceed \$15, plus proportionate payment for antepartum visits made.

e. Therapeutic abortions: For therapeutic abortions or spontaneous abortions requiring an operation including preoperative and postoperative care, the rate of payment will not exceed that established by the state health agency for care during labor and six weeks post partum.

f. Ectopic pregnancy: For treatment of ectopic pregnancy including preoperative and postoperative care, when laparotomy is performed by attending physician, rate of payment will not exceed the rate established by the state health agency for "complete maternity care."

g. Care of newborn infant by pediatrician: Routine care of newborn infant for first two weeks by a qualified pediatrician when infant is referred by obstetrician who does not customarily provide routine care of infants, at a rate established by the state health agency not to exceed \$6 per week. If fewer than three visits to the infant per week are made by the pediatrician, proportionate payment to be made for services rendered.

2. Hospital Care During Pregnancy, Labor or Within Six Weeks After Termination of Pregnancy: Authorization may be made for a maximum of fourteen days (with extension of care authorized, when necessary, for two week periods, after review by the state or local health agency) with payment at the "per diem rate" established for payments to the hospital by the state health agency times the number of days' stay in the hospital (in accordance with the Children's Bureau memorandum of Sept. 1, 1943, "Purchase of Hospital Care Under Programs for Maternal and Child Health and Crippled Children").

3. Medical and Surgical Services Provided Through Clinics and Hospitals: When a patient has sought and received care in a clinic or hospital, the payments to the clinic or hospital will cover payments of the cost (including maintenance and salaries) of all medical services provided by interns, residents or other physicians employed part time or full time by the clinic or hospital and by the physicians supervising or assisting the interns or resident physicians, as well as payment for all other services provided by the clinic or hospital, as follows:

a. For clinic services (other than state or local health agency clinics): At rates not to exceed the cost per clinic visit times the number of clinic visits and not to exceed the maximum rate established by the state health agency.

b. For hospital services: The "per diem rate" established for payments to the hospital by the state health agency times the number of days' stay in the hospital (in accordance with the Children's Bureau memorandum of Sept. 1, 1943, "Purchase of Hospital Care Under Program for Maternal and Child Health and Crippled Children").

c. For clinic and hospital service: Many hospitals have an inclusive flat rate covering outpatient and inpatient medical and hospital maternity care. This flat rate may be paid if it does not exceed the total of a and b.

B. For the Infant.—1. Medical and Surgical Services for Sick Infant Provided by Physicians in Private Practice:⁶ This includes care that has been sought on behalf of, and received by, a sick infant in the private practice of a physician (home, hospital or office) during the infant's first year of life. For this type of care payment is to be made directly by the state health agency to the physician. It also covers care sought on behalf of, and received by, a sick infant in the private practice of a physician employed full time or part time by a medical school, payments for which may be made to the medical school or to the physician depending on the customary procedure for the receipt of such payments.

4. No authorization would be issued, nor payments made, for antepartum care given in antepartum clinics conducted by state or local public health agencies. However, authorization for hospital care planned for through such a clinic would be necessary and should be requested by the physician in the clinic.

5. For services of consulting specialists, see section C, item 1.

Medical care may be authorized for a period not to exceed three weeks, with review by the state health agency before authorizing extension of care.

a. Medical care, including minor surgery: At weekly rates established by the state health agency but not to exceed \$12 for the first week of illness, and, if fewer than four visits for examination or treatment are made during the week, proportionate payment to be made for services rendered. For succeeding weeks of illness \$6 and, if fewer than three visits for examination or treatment are made in any week, proportionate payment to be made for services rendered.

b. Major surgery: Additional payments may be authorized by the state health agency to attending physicians who qualify as consultants (for qualifications for consultants see section IV, 2) in a surgical specialty, for major surgical operations performed on infants under their care (exclusive of care for which infants are eligible under state crippled children's programs), at rates of payment to be established by the state health agency but not to exceed a total of \$50 for preoperative, operative and postoperative care.

2. Hospital Care: Hospital care during the first year of life may be authorized for fourteen days (with extension of care authorized, when necessary, for two week periods after review of case by state or local health agency): At the "per diem rate" established for payments to the hospital by the state health agency times the number of days' stay in the hospital (in accordance with the Children's Bureau memorandum of Sept. 1, 1943, "Purchase of Hospital Care Under Programs for Maternal and Child Health and Crippled Children").

3. Medical and Surgical Services Provided Through Clinics and Hospitals: When care of a sick infant has been sought and received in a hospital or clinic, the payments to the clinic or hospital will cover payment for the cost (including maintenance and salaries) for all medical services provided by interns, residents and other physicians employed part time or full time by the clinic or hospital and by physicians supervising or assisting interns or resident physicians, as well as payment for all other services provided by the clinic or hospital, as follows:

a. For clinic services: At a rate not to exceed the cost per clinic visit times the number of clinic visits and not to exceed the maximum rate established by the state health agency.

b. For hospital services: The "per diem rate" established for payments to the hospital by the state health agency times the number of days' stay in the hospital (in accordance with the Children's Bureau memorandum of Sept. 1, 1943, "Purchase of Hospital Care Under Programs for Maternal and Child Health and Crippled Children").

4. Immunizations in Physicians' Offices, at Child Health Conferences or Immunization Clinics Not Conducted by State or Local Health Agencies:⁶ At rates established by the state health agency but not to exceed \$6 total for immunization for smallpox, diphtheria and whooping cough (plus the cost of biologic products in states where these are not provided without cost by the state or local health agencies). These immunizations usually will require, during the first year of life, one procedure for smallpox, two or three for diphtheria and three for whooping cough. If immunizations for all three diseases are not completed, proportionate payment is to be made for services rendered.

NOTE.—Health Supervision of Infants.—In child health conferences: Health supervision of infants may be arranged for in child health conferences made available by state or local health agencies or by voluntary health agencies. For the present, the cost of health supervision through conferences may be met from Maternal and Child Health funds made available under title V, part 1, of the Social Security Act.

Administrative problems relative to the inclusion under the Emergency Maternity and Infant Care program of health supervision of infants in physicians' offices are now being studied by the Children's Bureau and will be reviewed in the near future with state and local officials responsible for the administration of the program. These problems include the desirable minimum requirements of training and experience to be established for physicians providing health supervision of infants and the methods of authorizing and making payments for such supervision provided in physicians' offices. When decisions with respect to payment for health supervision of infants are reached, a supplement to this statement of policy will be issued.

It is recommended, therefore, that authorization for health supervision of infants, except for immunizations, not be given under the Emergency Maternity and Infant Care program until the Children's Bureau policy on these matters has been made available to state administrative agencies.

6. No authorization would be needed, nor payment made, for immunization at child health conferences or immunization clinics conducted by state or local public health agencies.

C. *For the Wife or Infant.*—1. Consultation Services Requested by Attending Physician (from consultants on list approved by the state health agency): a. Long distance telephone consultation: The actual cost of the call.

b. Bedside consultation or assistance or minor surgery: At the rate of payment established by the state health agency but not to exceed \$10 per consultation.

c. Consultation which includes performance of a major surgical operation by the consultant and for the preoperative and postoperative care provided by the consultant: At the rate of payment established by the state health agency but not to exceed \$50.

2. Bedside Nursing Service in Home or Hospital, When Requested by Attending Physician, for Wife or Infant Receiving Care Under EMIC Program: a. In a hospital by graduate nurses: Special nursing services during a period of critical illness when such nursing services cannot be provided by nurses employed by the hospital and when no expenditures for special nursing service have been included in the hospital's annual statement of operating expense may be authorized for a period not to exceed four days, with review by state (or local) health agency before authorizing extension of care, at prevailing local hourly or per diem rates not to exceed maximum rate established by state health agency.

b. In the home by nursing staff of a voluntary public health or visiting nurse agency or by graduate nurses (when such nursing services cannot be made available by state or local public health agencies): (1) Visits for care of mother and infant while the mother is receiving bed care during the puerperium may be authorized not to exceed six visits, with review by state health agency, before authorizing extension of care, at prevailing local rates per visit but not to exceed the maximum rate established by the state health agency.

(2) Visits for care of a sick mother or infant may be authorized not to exceed fourteen visits with review by the state health agency, before authorizing extension of care, at prevailing local rates per visit but not to exceed the maximum rate established by the state health agency.

(3) Nursing care throughout the period of labor and delivery may be authorized at prevailing local rates but not to exceed maximum rate established by state health agency.

(4) Special nursing services on an hourly or per diem basis during a period of critical illness may be authorized for a period not to exceed four days, with review by a state health agency before authorizing extension of care, at prevailing local rates not to exceed the maximum rate established by the state health agency.

(5) Visits for care of a patient who has complications, in order to carry out specific orders by the physician, such as determining blood pressure, urinalysis or giving special treatments or medications may be authorized not to exceed six visits, at prevailing local rates per visit but not to exceed the maximum rate established by the state health agency.

3. Blood for Transfusions: This may be authorized at the customary minimum rate paid by the hospital but not to exceed the maximum rate established by the state health agency.

4. Ambulance Service: When requested by attending physician or hospital, ambulance service may be authorized at prevailing local rates not to exceed the maximum rate established by the state health agency.

5. Additional Payment for Time in Travel and for Cost of Travel to Attending Physician or Consultant: This may be authorized for attending seriously ill patients or for home deliveries, outside of city limits of physician's residence, at rates established by the state health agency, not to exceed 25 cents per mile each way traveled outside the city limits, with maximum payment of \$25 to a physician for travel for any 1 case.

6. Additional Payment for Cost of Travel of Graduate Nurse: Additional payment to a graduate nurse not employed by a public or voluntary health agency to the home of a patient may be allowed at the cost of transportation outside city limits on a public carrier or at the usual rate for mileage established for state employees.

DISCUSSION

The appropriation act for emergency maternity and infant care states that the funds are to be used to provide medical, nursing and hospital maternity and infant care. Review of the discussions in Congress clearly indicates that it has been the intent of Congress to provide as complete and as satisfactory medical, nursing and hospital care during the maternity period and the first year of the infant's life as is possible to obtain. To supplement when necessary the care usually recognized as required for the uncomplicated maternity case or for the sick infant, special additional care needed for complications or serious illness is therefore included under the program. This includes, as neces-

sary, consultation and diagnostic assistance of specialists, which should be made as freely available as possible under the program, prolonged hospital care, special nursing service, and special therapeutic measures such as blood for transfusion when applied for by the attending physician, clinic or hospital during the period when care has been authorized.

Calling a consultant should not affect the rate of payment to the attending physician if he continues to provide care to the patient.

V. QUALIFICATIONS FOR PHYSICIANS AND NURSES PARTICIPATING IN THE PROGRAM

1. *For Obstetric Services.*—Qualifications required of practitioners performing obstetric services under the program shall be established by each state health agency.

2. *For Medical Services Other Than Obstetric.*—Graduates of medical schools approved (at time of graduation or subsequent to graduation) by the Council on Medical Education and Hospitals of the American Medical Association. Individual exceptions may be made when a person with the degree of doctor of medicine who is not a graduate of a medical school approved (at time of graduation or subsequent to graduation) by the Council on Medical Education and Hospitals of the American Medical Association has completed postgraduate training which, in the opinion of the state health officer and his technical advisory committee, makes him competent to participate in this program.

Additional Qualifications for Consultants.—Specialists who are certified by their respective American boards of medical specialties, or whose training and experience meet the requirements of training and experience for admission to the examinations of such boards, should be designated as consultants by the state health departments and, whenever possible, made available for bedside consultation (or telephone consultation when bedside consultation is not feasible) with physicians participating in the plan. Physicians who have had at least one year of graduate training in a residency in their specialty approved by the Council on Medical Education and Hospitals of the American Medical Association and at least one year's experience limited to the practice of the specialty may be designated as assistant consultants.

For areas where consultants with the training and experience as set forth in the preceding paragraph are not available, a state technical advisory committee, appointed by the state health agency for this program, should recommend to the state health agency a plan for providing consultation to patients living in such areas.

Lists of physicians approved by the state health agency as consultants in the various specialties should be made available to all physicians participating in the program.

3. *For Pediatric Services to Newborn Infants Referred by Obstetricians.*—Diplomates of the American Board of Pediatrics or physicians who have completed at least one year of graduate training in a pediatric residency approved by the Council on Medical Education and Hospitals of the American Medical Association.

4. *For Nursing Service Purchased on a Case Basis.*—Graduate nurses registered or eligible for registration by meeting requirements of the state board of nurse examiners and having had training and experience in maternity and/or pediatric nursing as required by the state health agency.

VI. MINIMUM REQUIREMENTS FOR HOSPITALS PARTICIPATING IN PROGRAM

The following represent minimum requirements that will be used by the Children's Bureau in reviewing state plans for approval. A state health department may use them as a basis for preliminary approval of hospitals for obstetric care, but they should not be construed as establishing even minimum standards for such hospitals.

Since in the various states wide differences will be found in hospital facilities available, some state health departments will be able to establish higher requirements than others. Each should develop a set of requirements that are as high as are practicable under existing conditions and should consider the possibility of raising the requirements as soon as possible.

Since in some states it will be practicable to establish minimum requirements that could not be met by many of the hospitals in other states, those requirements which should be considered absolutely minimum for emergency approval under any conditions have been indicated by one star (*), and those which should be established as minimum when conditions permit, either at the time of approval or later, have been indicated by two stars (**).

1. BUILDINGS

- * Obstetric care shall be authorized only in buildings that meet state or local rules and regulations for fire protection and sanitation.
- * Buildings shall be adequately screened to give protection against flies and mosquitoes.
- * Every room in which maternity patients or newborn infants are cared for shall have at least one window to provide light and ventilation (unless forced ventilation is provided).

There is evidence that sunlight passing through ordinary window glass has some bactericidal action. Change of air content of rooms by admitting outdoor air tends to reduce the bacterial content of the air and adds to the patient's comfort.
- * In every room used in the care of maternity patients and newborn infants there shall be artificial lighting adequate for the purposes for which the room is used.
- * There shall be provision for adequately heating the building in cold weather, with maintenance of a fairly uniform temperature in delivery rooms and nurseries.

The shock of labor and delivery for mother and infant make provision of suitable environmental conditions essential. The newborn infant's need for artificial heat after leaving the protection of the uterus is obvious, and chilling may be fatal especially to premature infants.

2. MATERNITY UNIT

- * Maternity patients and newborn infants shall be cared for only in wards or rooms completely separated from other wards or rooms in which patients with communicable diseases or septic conditions are cared for.

The special susceptibility of puerperal women and newborn infants to various types of infection is well known. The danger of cross infection will be less the greater the degree of separation of these patients from all other patients; i. e., in a separate wing, a separate floor or a room or rooms separated by a partition from that section of the hospital in which patients with septic conditions or communicable diseases are cared for.

- ** Maternity patients shall be cared for only in a part of the hospital in which complete separation from all other patients is possible.

a. Facilities for Delivery

- * If there is no delivery room separate from the general operating room, patients shall be delivered in their own rooms except in case of cesarean section. There shall be conveniently located facilities for the attendants at delivery to scrub their hands.

Since the parturient woman is especially susceptible to infection, it is unwise to deliver her in a room used for septic cases regardless of the care with which cleaning of the room is carried out. Hand scrubbing facilities are essential to the use of aseptic technic.
- ** There shall be a properly equipped delivery room used exclusively for the delivery of noninfectious patients. There shall be running water in this room or adjacent to it.
- * There shall be suitable facilities for administering general anesthesia.
- * There shall be suitable apparatus for administering oxygen to infants.
- * A reliable method for identifying each infant shall be applied in the delivery room.

b. Nursing Services

- * A graduate registered nurse shall be responsible at all times for nursing care of both maternity patients and newborn infants.
- ** At least one graduate registered nurse shall be on duty at all times to supervise the care of both maternity patients and newborn infants.

Every puerperal woman and newborn infant needs skilled nursing care. This is essential not only for the normal needs but because of the potential danger to both from infection and hemorrhage and the danger to the infant from asphyxiation.

In addition, the nurse is the person who is responsible throughout the twenty-four hours and will often be required to make decisions vital to the patients' safety (both mother and infant) in absence of the physician.

c. Care of Utensils and Linen

- * There shall be facilities for disinfection or, preferably, sterilization of bedpans.

Contaminated bedpans may be a source of cross infection.

- * There shall be adequate and suitable receptacles for soiled linen (bed linen; gowns and diapers).

Soiled linen may, if not kept in closed containers, be a source for spread of infection.

- ** There shall be a utility room used for maternity patients only.

d. Laboratory and Clinical Facilities

- * There shall be facilities in the hospital or available in the community for laboratory examinations, including blood counting, hemoglobin determinations and urinalyses.
- ** A separate room shall be provided in the hospital for a laboratory.
- * There shall be facilities in the hospital always ready for intravenous therapy.
- ** There shall be serum available in the hospital for blood matching for transfusions.
- * The hospital shall provide adequate facilities for sterilization of equipment, supplies and instruments.

e. Records

- * A clinical record shall be kept for each patient, mother and infant separately.

f. Accommodations for Patients

1. For the mothers:

- * Rooms or wards in which maternity patients are cared for shall provide average space equal to at least 60 square feet per patient.

To provide for adequate ventilation, for space for bedside care of the patient and for separation of the patients sufficient to minimize respiratory cross infections.

- ** Rooms or wards in which maternity patients are cared for shall provide average space equal to at least 80 square feet per patient.

- * There shall be a separate bed for each patient.

- ** There shall be a separate thermometer and a bedpan for each patient.

Handwashing facilities:

- * Running water shall be conveniently available to every room in which maternity patients are cared for.

To facilitate hand washing by staff (medical and nursing) before and after caring for each patient. Hand washing is one of the important measures for prevention of infection. The more convenient the facility, the more likely it is that the hand scrubbing will be done.

- ** Running water shall be available in each room or ward.

Isolation facilities:

- * A room shall be available at all times in which a maternity patient who has an infection may be isolated.

Prevention of spread of infection from 1 patient to another depends on separation of the patient who is suspected of having an infection from noninfected patients and in maintaining rigid separate isolation of the infected patient until cured or, preferably, until discharged from the hospital.

- ** Space shall be available at all times for isolation of at least 1 patient for every 25 obstetric beds or fraction thereof.

Dietary department:

- * Food adequate for the needs of the parturient women shall be prepared and served under sanitary conditions.

- ** If the food service is not under the direction of a qualified dietitian, consultation should be obtained from a dietitian or nutritionist available to the community.

2. For the infants:

-Nursery facilities:

- * If newborn infants are not kept in their mothers' rooms, a separate nursery shall be provided for them, which is used for no purpose other than the care of such infants.

- * Provision shall be made to exclude visitors from contact with infants. If infants are kept in their mothers' rooms, a separate room must be made available in which to place them during visiting hours.

To prevent respiratory infections in newborn infants, they should be isolated from visitors.

- * Each infant shall have a separate bassinets.

In order to minimize the danger of cross infection, 2 infants should never occupy the same bassinets, even if they are twins.

- * Individual bassinets shall be separated by at least 6 inches.

Separation of bassinets is required (1) so that bedclothes from one bassinets will be less likely to come in contact with those on either side and (2) to facilitate bedside care of each infant.

- ** Individual bassinets shall be separated by at least 12 inches.

- * Nurseries shall be large enough to provide an average of at least 16 square feet of floor space per infant.

This is the minimum space that will permit proper spacing of beds (6 inches from walls and 6 inches between beds) and that will provide space for the nurse to care for the infant.

** Nurseries shall be large enough to provide an average of at least 20 square feet of floor space per infant.

* There shall be provided for premature infants at least one incubator or some type of heated bed for each 20 bassinets for full term infants or any fraction thereof.

* There shall be provided in the nursery facilities for washing or disinfecting the hands.

To avoid carrying infection to infants the hands must be carefully washed both before and after caring for each infant.

Isolation for infants:

* There shall always be available a room in which infants who have or who are suspected of having infections may be strictly isolated from the well infants and from one another.

To prevent spread of infection, there should be provision for immediate isolation of any infants suspected of having an infection.

Clinical facilities for infants:

* There shall always be available facilities for oxygen administration suitable for use with infants.

Newborn infants, especially premature infants, are prone to respiratory difficulties. Oxygen administration is essential for combating these difficulties.

* There shall always be available either in the hospital or in the community sterile sets for intravenous or subcutaneous administration of blood or other fluid to infants.

Facilities for preparation of milk mixtures:

* There shall be suitable space and adequate equipment for preparation of milk mixtures (formulas) and for their sterilization and refrigeration.

** There shall be a separate room used exclusively for the preparation of sterile milk mixtures.

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status.—A subcommittee of the Senate Committee on Education and Labor has recommended to the full committee that the Veterans' Education Bill, S. 1509, be reported favorably with certain modifications. A subcommittee of the Senate Committee on Commerce has been conducting hearings on S. 1096, a bill to establish a Bureau of Vital Records in the United States Public Health Service. Several state directors of vital statistics have testified before the subcommittee.

Bills Introduced.—S. 1616, introduced by Senator Wiley, Wisconsin, proposes to make available additional benefits for veterans of World War II in the form of vocational rehabilitation and educational benefits under the direction and supervision of the Administrator of Veterans' Affairs. S. 1633, introduced by Senator Walsh, Massachusetts, at the request of the Navy Department, proposes to amend the nurse training act so as to provide that the head of any department, establishment or other federal agency may request and accept transfers of student nurses, who are transferable under the original act, to a federal hospital operated by his agency in continental United States, exclusive of Alaska, and to provide for the continued training of such student nurses requisite to graduation. The period of training of such transferee may not extend beyond the period required for graduation by the institution from which the student nurse was transferred and may be terminated at any time prior thereto as the interests of the service may require. H. R. 3904, introduced, by request, by Representative Randolph, West Virginia, provides for the detention, care and treatment of persons suffering from diseases of the mind in certain federal reservations. H. R. 3920, introduced by Representative Fernandez, New Mexico, proposes to grant the state of New Mexico new lands for the Tingley Crippled Children's Hospital and for elementary and secondary vocational trade schools. H. R. 3935, introduced by Representative Rogers, Massachusetts, proposes an appropriation of \$500,000,000 to construct additional veterans' hospitals. H. R. 3973, introduced by Representative Rogers, Massachusetts, declares the Veterans' Administration to be an agency of the United States vital and essential to the successful prosecution of the war and entitled, second only to the War and Navy Departments, to priorities in personnel, equipment, supplies and material under any laws, executive orders and regulations pertaining to priorities. The Secretary of War and the Secretary of the Navy will be authorized to transfer any personnel, whether commissioned, enlisted or inducted, from the Army or Navy respectively to the Veterans' Administration, with the proviso that, to the extent practicable, personnel so transferred should be selected from those persons not qualified for general service in combat areas. H. R. 3921, introduced by Representative Rogers, Massachusetts, is similar to H. R. 3973 in granting priorities to the Veterans' Administration but in addition directs the Administrator of Veterans' Affairs and the Federal Board of Hospitalization to expedite and complete the construction of

additional hospital beds for war veterans and to enter into contracts for the use of permanently constructed Army and Navy hospitals by the Veterans' Administration after cessation of hostilities and after such institutions are no longer needed by the armed services.

STATE MEDICAL LEGISLATION

Kentucky

Bill Introduced.—H. 16 proposes to enact a separate naturopathic practice act and to create a board of naturopathic examiners to examine and license applicants for licenses to practice naturopathy. Naturopathy, according to the bill, means "Nature cure or health by natural methods" and is defined as "the prevention, diagnosis and treatment of human injuries, ailments and diseases by means of any one or more of the psychological, physical or mechanical, chemical or material, forces or agencies of Nature." Naturopaths are to be permitted to practice obstetrics if they "first comply with the requirements of the County Board of Health, by taking the required examination and obtaining a midwife license" but they are not to be authorized to "perform any surgical work other than minor matters."

New York

Bills Introduced.—A. 12 proposes so to amend the hospital lien act as to provide specifically that a hospital lien may not be asserted with respect to personal services rendered by any physician or surgeon. S. 9 proposes to enact an optical dispensing act and to create a state board of examiners in optical dispensing to examine and license applicants for licenses to practice optical dispensing, which is defined to embrace the compounding and dispensing of lenses, spectacles, eyeglasses, optical devices or other optical appliances to the intended wearer thereof on written prescriptions from licensed physicians or optometrists for the aid, correction, relief or treatment of visual or ocular anomalies of the human eye.

Rhode Island

Bills Introduced.—H. 560 proposes to extend until the adjournment of the 1945 session of the legislature the life of the special Rhode Island public health laws survey commission authorized by the legislature in 1943. H. 564 proposes to prohibit the manufacture, possession for sale, or sale of stated caustic poisons used as household chemicals unless the containers thereof bear the word POISON in heavy faced caps. The bill also proposes to prohibit the manufacture or sale of ammonia or any chlorinated form of bleaching fluid the label or package of which bears any false or misleading statements, or, in the case of ammonia, which contains less than 8 per cent of actual ammonia, or, in the case of chlorinated bleaching fluid, which contains less than 2¼ per cent of available chlorine. The bill also proposes to prohibit the manufacture and sale of chlorinated bleaching and disinfecting fluids which are artificially colored.

Medical News

(PHYSICIANS WILL CONFIR A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS FILIATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH)

ARKANSAS

University News.—Recent lecturers at the University of Arkansas School of Medicine, Little Rock, have included Dr. Olympio da Fonseca Jr., Rio de Janeiro, on "Malaria" and "Dermatocomycosis"; Dr. Arnold D. Welch, Glen Olden, Pa., "Recent Advances in Sulfonamide Drugs," and Dr. Irving S. Wright, New York, "Peripheral Vascular Diseases" and "Capillary Studies."

GEORGIA

Changes in the Faculty.—Dr. Robert C. Major has resigned as assistant in surgery at Emory University School of Medicine, Atlanta, to become full time professor of thoracic surgery at the University of Georgia School of Medicine, Augusta, effective January 1. Dr. John Robert Rinker, Fort Worth, has been appointed full time professor of urology at Georgia.

ILLINOIS

Crippled Children Unit in New Home.—The division of services for crippled children of the University of Illinois recently was moved into the Bressmer Home, 1105 South Sixth Street, Springfield. The administrative and accounting offices occupy the first floor, the record and file rooms, the central nursing district office and the conference room the second floor, while the third floor is now used for storage but can be furnished and used for offices if required. The service of the division is carried on through a field staff of orthopedic and public health nurses working out of district offices in Chicago, Peoria, Springfield, Champaign and Mount Vernon. These nurses plan and supervise annually some seventy orthopedic clinics at key cities in the state, which are usually attended by about 2,500 children for diagnostic and follow-up care. When the division was established in 1937 it was a unit of the department of public welfare. At the beginning of the 1941-1942 fiscal year for administrative reasons and in accordance with an agreement between the department of public welfare, the University of Illinois and the commission for handicapped children, the division was placed under the jurisdiction of the university which also administers the Illinois Surgical Institute for Children, a state owned and state supported institution established for the surgical care of children. The division was created as an official state agency under the Federal Social Security Act to extend and improve services for locating crippled children and to provide medical, surgical and corrective facilities for diagnoses, hospitalization and after-care for the children who are crippled or who are suffering from conditions which lead to crippling. Under the setup the division is not able to extend care to persons who have attained their twenty first birthday. A recent development, however, has been the extension of this rule to provide that assistance may be given to persons over 21 who are victims of poliomyelitis. Twenty five thousand dollars of the \$225,000 appropriation recently approved for the current biennium has been earmarked specifically for victims of poliomyelitis without respect to age.

Chicago

Personal.—Miss Elizabeth F. Carr, librarian of the New York Post-Graduate Medical School, Columbia University, New York, has been appointed librarian of the Archibald Church Library of Northwestern University Medical School to succeed Miss Louise Walker, resigned, effective January 1. Miss Carr will begin her new position February 1. —Dr. Rafael Mendez, instructor in pharmacotherapy, Harvard Medical School, Boston, has been appointed assistant professor of pharmacology at the Loyola University School of Medicine.

Lectures on Medical Care.—Dr. Morris Fishbein, Editor of THE JOURNAL, opened a series of lectures on medical care at the University of Illinois College of Medicine, January 12, with a talk entitled "Health of the American People." The series is sponsored by the Student Council of the college of medicine and other lecturers include

Joseph Dean Lohman, A.M., January 26, Health and the Distribution of Medical Care
Dr. Roland R. Cross, Springfield, February 9, Preventive Medicine and Public Health

Dr. Victor Johnson, Secretary to Council on Medical Education and Hospitals, American Medical Association, February 23, Role of Postgraduate Education in Modern Medicine
Dr. Chaucey C. Maher, March 8, Chronic Disease and Its Implications as a Social Problem
Lawrence J. Litch, March 22, Correlation of Medical Services with Governmental Agencies
A. M. Simons, Assistant Director, Bureau of Medical Economics, American Medical Association April 12, Organization of Medical Services in America
Louis Wirth, Ph.D., Plans for Medical Care

INDIANA

Library Collection as Memorial to Dr. Hutchins.—A portion of the library of the late Dr. Frank F. Hutchins has been given by his wife, Mrs. Luella Hutchins, to the University of Indiana Medical Center, Indianapolis, to be set up in a separate library unit as a memorial to the physician who was a member of the medical school for many years. Dr. Hutchins became a member of the faculty of the State College of Physicians and Surgeons when it was organized in 1906, and when the Indiana Medical College was united with the Indiana University School of Medicine in 1908 under the name of the latter he became professor and head of the department of mental and nervous diseases. Dr. Hutchins served as a member of the committee which worked out the organization of the faculty of the two schools after study of the medical schools at Harvard, Johns Hopkins and Pennsylvania universities. He served without compensation as departmental chairman until his retirement in 1938. Dr. Hutchins died in February 1942.

Secretaries' Conference.—The Indiana State Medical Association will conduct its annual secretaries' conference at the Indianapolis Athletic Club, Indianapolis, January 23. The morning session will be devoted to a school for speakers who will talk to lay groups on the Wagner-Murray-Dingell bill, at which Dr. Homer G. Hamer, Indianapolis, will give an outline plan for speakers, Mr. Clarence A. Jackson, Indianapolis, "The ABC's of Social Security", William Norwood Bragance, Ph.D., Crawfordsville, professor of speech, Wabash College, "Making the Speech Count" and Dr. Franklin S. Crockett, Lafayette, "Addressing Local Lay Groups." At the conference in the afternoon, the speakers will include

Dr. Charles N. Combs, Terre Haute, Hospital Plans in Indiana
Dr. Edward J. McCormick, Toledo, Ohio, Public Relations and the Medical Profession
Mr. J. W. Holloway Jr., Chicago, National Legislative Problems
Dis. Norman M. Beatty and Joseph William Wright, Indianapolis, Local Legislative Problems
Dr. Eldridge M. Shanklin, Hammond, Your Part in Making a Better State Medical Journal

IOWA

Dr. Mengert Goes to Southwestern Medical School.—Dr. William F. Mengert, since 1938 associate professor of obstetrics and gynecology at the State University of Iowa College of Medicine, Iowa City, has resigned to become professor and head of the department of obstetrics and gynecology at the Medical School of the Southwestern Medical Foundation, Dallas.

KENTUCKY

Committee Named to Seek Funds for Tuberculosis Sanatoriums.—The Kentucky State Medical Association has appointed a committee of three to present the needs for two tuberculosis sanatoriums in the state in a bill to the legislature asking for appropriations. The members are Drs. Carl Norfleet, Somerset, representing central Kentucky, William Clark Bailly, Harlan, representing eastern Kentucky and Carl C. Howard, Glasgow, representing western Kentucky. The state society will ask the state to appropriate \$500,000 to build two sanatoriums, one in eastern Kentucky and one in western Kentucky and, in addition, \$100,000 for maintaining the institutions for one year after they are built.

LOUISIANA

New Orleans Graduate Medical Assembly.—The eighth annual session of the New Orleans Graduate Medical Assembly will be held March 6-9, at which the following will participate:

Dr. Robert L. Levy, New York, Cardiology
Dr. Carroll S. Wright, Philadelphia, Dermatology
Dr. Walter L. Palmer, Chicago, Gastroenterology
Dr. Robert A. Ross, Durham, N. C., Gynecology
Dr. Ralph H. Major, Kansas City, Mo., Medicine
Dr. Abraham Myerson, Boston, Neurophysiology
Dr. John W. Harris, Madison, Wis., Obstetrics
Dr. H. Winnett Orr, Lincoln, Neb., Orthopedic Surgery
Dr. Chevalier L. Jackson, Philadelphia, Otolaryngology
Dr. Paul R. Cannon, Chicago, Pathology
Dr. Henry G. Poncher, Chicago, Pediatrics
Dr. Louis A. Bute, Rochester, Minn., Proctology
Comdr. Lewis Kraer Ferguson (MC), U. S. Naval Reserve, Surgery
Dr. George T. Pack, New York, Surgery
Dr. Frank Hinman, San Francisco, Urology

MICHIGAN

Annual Clinic Day.—Mount Carmel Mercy Hospital, Detroit, will conduct its annual clinic day on January 26. Dr. Louis J. Gariepy, chief of staff, and Dr. Edward Dowdle will open the program. Other speakers will include:

- Dr. Harold Henderson, Detroit, The Role of the Cervix in Obstetrics.
- Dr. Joseph L. DeCoursey, Cincinnati, Riedel's Struma Disease of the Thyroid Gland.
- Dr. Fredrick F. Yonkman, Detroit, Some Recent Advances in Therapeutics.
- Dr. Charles M. McKenna, Chicago, Interesting Anomalies of Genito-urinary Tract.
- Dr. Norman Charles Bender, Buffalo, Meningitis in Children.
- Dr. Thomas E. Jones, Cleveland, Cancer of the Colon.
- Dr. Robert A. Hittig, Ann Arbor, Tropical Diseases and Their Relation to the Postwar Period in the United States.
- Drs. Frederick A. Collier and Cyrus C. Sturgis, Ann Arbor, Newer Concepts, Diagnosis and Management of Diseases of the Liver.

At a luncheon meeting the speakers will be Drs. Eugene C. Keyes, Dearborn, Edgar H. Norris, Detroit, and Claude R. Keyport, Grayling.

Secretaries' Conference and School of Information.—A feature of the annual secretaries' conference of the Michigan State Medical Society at the Book-Cadillac Hotel, Detroit, January 30, will be a school of information to discuss trends in the regimentation of medicine. The speakers will be Mr. J. W. Holloway Jr., Chicago, Dr. L. Fernald Foster, Bay City, Dr. Robert L. Novy, Detroit, and Mr. William J. Burns, Lansing. Other speakers on the program will be Dr. Edward J. McCormick, Toledo, Ohio, "Need for Public Relations," and Floyd E. Armstrong, A.M., Cambridge, Mass., "Bureaucracy as It Affects Medicine." "Information to the Public," presented by Mr. Thomas A. Hendricks, Indianapolis, and Paul D. Bagwell, M.A., East Lansing, will be discussed by Dr. G. Lombard Kelly, Chicago, Secretary, Council on Medical Service and Public Relations of the American Medical Association. An exhibit entitled American Medicine and Medical Service, prepared by Thomas G. Hull, Ph.D., Chicago, will be displayed during the meeting.

NEW YORK

Graduate Instruction.—Dr. Ralph G. Stillman, assistant professor of medicine (clinical pathology), Cornell University Medical College, will deliver a graduate lecture on "The Significance of Laboratory Tests and Methods in the Practice of Medicine" before the Suffolk County Medical Society, January 26, in Patchogue.

New York City

Lectures for the Public.—On February 3 a series of medical lectures will be opened by members of the faculty of Long Island College of Medicine, Brooklyn, for lay members of the Society of the Friends of the College and their guests. Dr. Jean A. Curran, president and dean of the medical school, will give an address and Arnold H. Eggerth, Ph.D., associate professor of bacteriology, will discuss "Penicillin Research." Others in the series will be:

- Dr. Howard W. Potter, February 10, War Nerves.
- Dr. Alfred C. Beck, February 17, The Birth of a Baby.
- Dr. Elberton J. Tiffany, February 24, Tropical Diseases, War and Postwar Aspects.
- Dr. Phillips F. Greene, March 2, On China's Medical Front.

Medical Education in Relation to the Practice of Medicine.—A symposium on medical education in relation to the practice of medicine of the future opened at the New York University College of Medicine, January 17, to continue weekly until February 21. Dr. Alan Gregg, medical director of the Rockefeller Foundation, gave the first lecture on "Looking to the Future." Other speakers will be:

- Leonard Carmichael, LL.D., Medford, Mass., January 24, The Relation Between Medical and Premedical Education.
- Joseph W. Mountin, assistant surgeon general, U. S. Public Health Service, January 31, Public Health in the Future Medical Curriculum.
- Dr. Louis Hamman, Baltimore, February 7, The Place of Psychiatry in the Teaching of Clinical Medicine.
- Dr. Franz Goldmann, New Haven, Conn., February 14, Instruction in Social and Economic Aspects of Medicine.
- Dr. Adam D. Macdonald, Manchester, England, February 21, Medical Education in Britain After the War.

Forum for Clinical Research.—The New York Academy of Medicine announced a forum for the first week of April in which research workers of the city and vicinity may present results of original research in clinical medicine. Presentations will be limited to twelve minutes. A brief period of free discussion will follow each presentation. The publication of presentations is not a necessary condition, but the academy plans to publish in its bulletin abstracts of presentations if the author so desires. The fact that material has in substance or

in part been presented elsewhere will not be regarded as a bar to presentation, provided the work represents recent research. The committee extends an invitation to all research workers of Greater New York and of neighboring cities within a radius of 100 miles to submit an abstract, not to exceed two hundred words in length, of proposed presentation to the secretary of the committee on medical education of the academy not later than March 1. A formal invitation will then be extended by the committee to the authors of papers selected for presentation to participate in this program.

Changes in Faculty at Long Island.—Recent promotions on the faculty at Long Island College of Medicine, Brooklyn, include:

- Dr. Thomas D. Dublin to professor of preventive medicine and community health.
- Dr. Edwin P. Maynard Jr. to professor of clinical medicine.
- George Samuelsen to assistant professor of chemistry.
- Dr. George E. Anderson to clinical professor of medicine.
- Dr. C. Thomas Chiamonte to assistant clinical professor of dermatology and syphilology.
- Dr. Walter A. Coakley to clinical professor of plastic and maxillofacial surgery.
- Nicholas B. Dreyer, M.A., to professor of pharmacology.
- Dr. Arthur E. Lamb to assistant clinical professor of medicine.
- Dr. Dorothy Loomis to assistant professor of pathology.
- Dr. A. W. Martin Marino to assistant clinical professor of surgery.
- George H. Paff, Ph.D., to associate professor of anatomy.
- Dr. John M. Pearce to associate professor of pathology.
- Dr. Howard W. Potter to professor of clinical psychiatry.
- Dr. Ainsworth L. Smith to assistant clinical professor of surgery.

Dr. Phillips Foster Greene, professor of surgery at the Hsiang Ya Medical College, Changsha, China, has been appointed visiting professor of surgery, effective from Dec. 1, 1943 to July 1, 1944. Dr. Matthew Gerard Golden was appointed assistant clinical professor of otolaryngology and Dr. Walter Mochle clinical professor of ophthalmology.

OHIO

The Rachford Lectures.—Dr. William E. Ladd, William E. Ladd professor of child surgery, Harvard Medical School, Boston, presented the twelfth annual series of the Benjamin Knox Rachford Lectures, January 18-19. His subjects were "Surgical Manifestations of Congenital Malformations of the Alimentary Tract" and "Experiences with Esophageal Atresia and Tracheoesophageal Fistulas." The Rachford lectureships were established as a memorial to Dr. B. K. Rachford because of his work in the physiology of digestion and other scientific investigations, his organization of the pediatric department of the University of Cincinnati College of Medicine and his leadership in providing medical care for underprivileged infants and children of the community and through the Babies Milk Fund Association.

Commission for Study of State Institutions.—Governor John W. Bricker has named a committee to study conditions and needs in all state mental institutions and to make recommendations regarding them to the governor and the state department of public welfare. Members of the new committee are Dr. George T. Harding, Columbus, councilor for the Tenth District of the state medical association; Leonard W. Mayo, dean of the School of Social Sciences, Western Reserve University, Cleveland; Dr. Arthur T. Hopwood, medical superintendent of the Institution for Feeble-minded, Apple Creek; Probate Judge Charles Chittenden, Toledo; William W. Greulich, Ph.D., head of the department of anatomy, Western Reserve University, Cleveland; Hal Griswold, Cleveland, attorney and former state welfare director, and Bleecker Marquette, executive secretary of the Public Health Foundation, Cincinnati.

Industrial Health and the Doctor.—The theme of a series of industrial health conferences to be presented in February under the auspices of the state medical association and the state department of health will be "Industrial Health and the Doctor." A similar program will be presented at each of the four centers: February 7 Toledo, Toledo Academy of Medicine Auditorium, February 8 Cleveland, Hotel Cleveland, February 9 Columbus, Deshler-Wallick Hotel, and February 10 Cincinnati, Netherland Plaza Hotel. The speakers will include:

- Dr. Carey P. McCord, medical consultant, Chrysler Corporation, Detroit.
- Dr. Frank F. Tallman, Lansing, director of mental hygiene, Michigan State Hospital Commission.
- Dr. Rutherford T. Johnstone, director, department of occupational diseases, Golden State Hospital, Los Angeles.

One hour at the afternoon session will be devoted to short informal discussions of the practical aspects of local industrial health problems, the role which the medical society should take and the responsibilities and obligations, as well as the opportunities, of the individual physician in industrial medicine and industrial health.

OKLAHOMA

Changes in the Faculty.—Mrs. Mildred T. Gossett, for years secretary to Major General Robert U. Patterson, M. C., U. S. Army, retired, formerly dean of the University of Oklahoma School of Medicine, Oklahoma City, has been appointed executive secretary of the medical school. Other changes on the faculty include:

John Walter Barnard, Ph.D., to assistant professor of anatomy.
Kenneth M. Richter, Ph.D., to assistant professor of histology and embryology.
Dr. Jack L. Valin to assistant professor of anesthesiology.
Dr. John W. Cavanaugh to assistant professor of surgery.
Dr. John F. Hackler to professor of hygiene and public health.
J. Allan Stanley, Ph.D., to assistant professor of physiology.
Dr. Noble Franklin Wynn to instructor in pharmacology (part time).

Samuel A. Corson, Ph.D., has resigned as assistant professor of physiology.

OREGON

Tuberculosis Program.—Dr. William R. Murlin has been lent by the U. S. Public Health Service to serve as acting director of the division of tuberculosis control of the Oregon State Board of Health. One of the recent activities of the department is an x-ray case finding program among industrial workers in Portland.

Changes in Health Officers.—Rudolph R. Lang, passed assistant surgeon, U. S. Public Health Service, was assigned as health officer of Deschutes County, succeeding Dr. Frederick P. Rogers, who is entering military service.—Dr. Louie A. Maulding, Nyssa, has been appointed health officer of Malheur, succeeding Dr. Clyde R. Walker, resigned.

PENNSYLVANIA

Physician Observes Ninety-Seventh Birthday.—Dr. Louis H. Gibbs, Scranton, who started to practice in West Scranton in 1878, observed his 97th birthday, December 22. He graduated at the Bellevue Hospital Medical College, New York, in 1873.

Philadelphia

Dr. Reeves Named Director of Health.—Dr. Rufus S. Reeves has been appointed director of health for a four year term to succeed Dr. Hubley R. Owen. Dr. Reeves took office January 3. As a part of his program Dr. Reeves announces the introduction of a series of weekly radio health broadcasts to educate the public to better health and appointed the following to serve as chairmen of the advisory committees to cooperate in the project:

Dr. Henry L. R. Bockus, stomach and intestinal diseases.
Dr. Frank A. Craig, tuberculosis.
Dr. Damaso de Ruvas, glandular diseases.
Dr. Charles W. Dunn, glands of internal secretion.
Dr. Harrison F. Flippin, pneumonia.
Dr. Sigmund S. Greenbaum, social hygiene.
Dr. Robert H. Ivy, plastic surgery.
Dr. Chevalier L. Jackson, bronchoscopic diseases.
Dr. Virgil H. Moon, laboratory studies.
Dr. John Royal Moore, bone and joint diseases.
Charles Patton, D.D.S., dentistry.
Dr. Frederic H. Leavitt, nervous and mental diseases.
Dr. Walter I. Lillie, diseases of the eye.
Dr. Charles F. Long, industrial medicine.
Dr. Samuel A. Loewenberg, internal medicine.
Dr. Clifford B. Lull, gynecology and obstetrics.
Dr. John D. McLean, public health.
Dr. Sarah I. Morris, preventive medicine.
Dr. Ralph M. Tyson, children's diseases.
Dr. Horace J. Williams, diseases of the ear, nose and throat.
Dr. Carroll S. Wright, diseases of the skin.
Dr. Ralph Pemberton, rheumatic diseases.
Dr. Alexander Randall, diseases of the urinary tract.
Dr. Thomas A. Shallow, surgery.
Dr. Anthony Sindoni Jr., diabetes.
Dr. Bernard P. Widmann, x-ray studies.
Dr. Michael G. Wohl, nutrition.
Dr. Charles C. Wolferth, diseases of the heart and blood vessels.

SOUTH CAROLINA

Public Health Election.—Dr. John Claude Sease, Little Mountain, was chosen president-elect of the South Carolina Public Health Association at its recent annual meeting in Columbia and Dr. George S. T. Peeples, Columbia, was installed as president. Mrs. Frank George, R.N., Columbia, is the secretary-treasurer.

Society Entertains Honorary Members.—The Greenville County Medical Society held a banquet on January 3 to pay tribute to its honorary members: Drs. Curran B. Earle and Chesley T. J. Giles, Greenville, Frederick G. James Greer, James W. Jervey and Fletcher Jordan, Greenville, Lawrence L. Richardson, Simpsonville, and Edward C. Stroud, Marietta. Dr. Wyatt Y. McDaniel, Taylors, also a honorary member, was unable to attend because of illness.

GENERAL

Red Cross Appeals for Funds.—The American National Red Cross announced that its appeal for funds will be conducted during the month of March, designated by President Roosevelt as Red Cross Month. In a release the Red Cross states that during 1944 it must supply some five million blood donations and each month during the year must recruit 2,500 nurses for the army and navy.

Medical Record Dedicated to Max Neuburger.—The *Medical Record* for December was dedicated to Dr. Max Neuburger, commemorating his seventy-fifth anniversary. Dr. Neuburger has been associated since 1939 with the Wellcome Historical Medical Museum, London. He formerly served as professor of the history of medicine at the University of Vienna and founded there the Institute for Medical History and Museum.

Slide Film Talkie on Public Health Service.—The Zurich General Accident and Liability Insurance Company has prepared a slide film talkie descriptive of the work of the U. S. Public Health Service and of the various state and county health departments. Copies have been sent to the health officers of the forty-eight states and the District of Columbia for their use. It is proposed to give wide distribution to the picture with a view to acquainting the American public with the health facilities available.

Examinations in Obstetrics and Gynecology.—The dates for the part II examination of the American Board of Obstetrics and Gynecology, to be held in the Hotel William Penn, Pittsburgh, have been changed from June 9-14 to June 7-13. The written examination and review of case histories (part I) for all candidates will be held in various cities in the United States and Canada, February 12. Additional information may be obtained from Dr. Paul Titus, secretary of the board, 1015 Highland Building, Pittsburgh 6.

Appointments to National Chamber of Commerce.—Dr. Leverett D. Bristol, executive director of the Hospital Council of Greater New York, has been appointed chairman of the health advisory council of the Chamber of Commerce of the United States, succeeding Dr. James S. McLester, Birmingham, Ala., who continues as a member of the council but who relinquishes the general chairmanship because of his increasing activity in the war service of the federal government and the state of Alabama. Dr. Anthony J. Lanza, chief of the occupational hygiene section of the Office of the Surgeon General, U. S. Army, has been named chairman of the council's committee on industrial health to succeed Dr. Bristol. Dr. McLester is a former president of the American Medical Association. Dr. Bristol and Dr. Lanza are members of the Council on Industrial Health of the American Medical Association.

Civilian Medicine to Gain from Progress in War Medicine.—A survey just concluded by the Johnson and Johnson Research Foundation, New Brunswick, N. J., indicates that substantial gains in civilian medicine will follow the conclusion of the war. A report states that "out of this war so far have come new therapeutic agents, new methods for treating shock, for preventing infections and healing wounds. New anesthetics are being used and new surgical skills are being developed." The world's many war theaters in effect are huge medical clinics where doctors in special fields accomplish results that might require years in peacetime. The new medical knowledge they are obtaining will be beneficial in days to come in preventing disease, in fighting infection, in treating accident victims and in such projects as opening up the tropics to human habitation at a higher standard of living. They will have a wide and beneficial application in civilian medicine, it was stated. This study discloses that the American medical profession, in cooperation with the surgeons general of the services, is striving constantly to shorten the lag between the development of new wartime medical discoveries and their application to those who need them.

Special Society Elections.—Anton J. Carlson, Ph.D., emeritus professor of physiology of the University of Chicago School of Medicine, has been elected president of the American Association for the Advancement of Science. Forest R. Moulton, Ph.D., Washington, D. C., is the permanent secretary. —The American Society of Anesthetists announces the following officers, among others, chosen at its annual election Dec. 9, 1943: Drs. Emery A. Roventine, New York, president; Ralph M. Waters, Madison, Wis., president-elect; Leo V. Hand, Boston, Hugh O. Brown, Chicago, and Kenneth Heard, Toronto, Canada, vice presidents; McKinnie L. Phelps, New York, secretary, John G. Dunlop, Los Angeles, assistant secretary; Virginia Appgar, New York, treasurer, and Elisha

D. Embree, Houston, Texas, assistant treasurer. Dr. Albert J. Erdmann Jr., New York, one of the original founders of the Long Island Society of Anesthetists (which later became the New York Society and still later the American Society) and one of the pioneers in the field of anesthesia, attended and spoke briefly at this meeting.—Warren F. Draper, assistant surgeon general, U. S. Public Health Service, Washington, D. C., was chosen president-elect of the Association of Military Surgeons of the United States at its annual meeting in October, and Col. Lucius A. Salisbury, National Guard, Scarsdale, N. Y., was inducted into the presidency. Col. James M. Phalen, M. C., U. S. Army, retired, Washington, is the secretary. The next annual meeting will be in New York, November 2-4.

Mortality Among Children with Rheumatic Fever.—Children with rheumatic fever are subject to a very high mortality during the acute phase of the disease, but once this stage is passed the death rate falls sharply, according to the *Statistical Bulletin* of the Metropolitan Life Insurance Company in reviewing a study of 2,817 policyholders of the company under age 20 who received nursing care between 1936 and 1938 by the company's visiting nurse service during an acute attack of the disease and have been followed up each year since. The study covers the group up to 1942. Of the group 257, or 1 out of every 11, have died, giving a mortality about fifteen times as high as would be expected in a group of young persons of like sex and age distribution. The death rate among the boys has been about one-fifth greater than among the girls. In a group of children who were definitely reported to have heart involvement during the attack there occurred 152, or nearly 60 per cent of all the deaths. The bulletin points out that since there is some degree of heart involvement in practically every attack of rheumatic fever, whether or not reported, it may be concluded that cases in which a heart condition was actually reported represent the most severe in the study. Nearly one fifth died in the first year following the acute attack in the group with reported heart involvement. The actual death rate was 184 per thousand each year as compared with 23 per thousand in the second year and an average of 16 in the subsequent period of observation. In contrast, the bulletin states, a death rate of little more than 1 per thousand has prevailed among children of these ages in the general experience of the company. Among the group reported without heart involvement, the death rate in the first year was 18 per thousand, 11 per thousand in the second year and an average of 7 per thousand during the remaining period. Heart disease was reported as the cause of 80 per cent of the deaths among the children in the study. According to the bulletin the majority of the cardiac deaths were due to rheumatic heart disease. Particular interest is attached to the high incidence of subacute bacterial endocarditis. Among the children studied there were 26 deaths from this cause, or 13 per cent of the total from heart disease. Older children were principally affected, 21 of these 26 deaths being recorded among those 10 years or older at first observation, whereas only a little more than half of the cases in the study were in this age group. There were 38 deaths in the group attributed to infectious diseases, with 18 charged to pneumonia. The bulletin points out that the study clearly indicates seriousness of rheumatic fever in childhood, stating that the disease is now a leading cause of disability and death in the school ages and in adults up to middle life.

CANADA

Society News.—The British Columbia Medical Association at its annual meeting recently choose the following officers: Drs. Philip A. C. Cousland, Victoria, president; Allen Y. McNair, Vancouver, Andrew H. Meneely, Nanaimo, vice presidents; Gordon O. Matthews, Vancouver, honorary secretary. —Dr. I. Newton Kugelmass, New York, gave the postgraduate fortnightly address at the University of Montreal, October 5, on "Blood Diseases in Children." He addressed the Montreal Medical Society the same day on "Early Recognition of Nutritional Deficiencies in Children."

CORRECTIONS

Gm. Instead of Mg.—In THE JOURNAL, Dec. 25, 1943, page 1115, in the article by Merrill, in the second column, under Conclusions, in the fifth line, 0.24 mg. should have been 0.24 Gm.

Tracheotomy in Bulbar Poliomyelitis.—In the article by Dr. T. C. Galloway in THE JOURNAL, Dec. 25, 1943, page 1096, the word "centimeter" at the end of the fifth line of the first case report and at the end of the fourth line in the report of case 3 should read "millimeter."

Government Services

New Supervisor of War Public Services

Mrs. Dorothy S. Bauman has been named supervisor of War Public Services for the Federal Works Agency in region I, comprising the New England states, New York, New Jersey and Pennsylvania. Mrs. Bauman "will supervise child care activities, including war nurseries and centers for before and after school care of young children of mothers in war essential jobs, and extended hospital and community services attributable to the war impact." Coincident with this announcement was one that \$500,000 had been allotted by the Federal Works Agency to New York City for the conversion of a part of Bellevue Hospital and the convalescent camp in Welfare Island, New York, for the treatment and control of venereal diseases.

Hospital Men Volunteers

The Office of Civilian Defense and the American Hospital Association are cooperating in a program to organize hospital men volunteers to remedy the shortage of nonprofessional male personnel in hospitals. A leaflet has been issued containing suggestions for forming this service. Additional information may be obtained from "Volunteer Aide Services in Hospitals," published by the United Hospital Fund, 370 Lexington Avenue, New York, "Volunteers in Health, Medical Care and Nursing," published by the Office of Civilian Defense (available from the local defense council), and the preliminary report of the Committee on Volunteer Workers, Council on Association Development, entitled "Guide for the Use of Volunteer Service in Hospitals" (available from the American Hospital Association, 18 East Division Street, Chicago).

Examination for Assistant Surgeon and Passed Assistant Surgeon

The U. S. Public Health Service announces an examination for appointment to the grade of assistant surgeon and passed assistant surgeon in the regular corps of the service. Applicants for assistant surgeon must not have passed their 32d birthday, and applicants for the grade of passed assistant surgeon must not have passed their 39th birthday on the date the written examination is begun. All applicants must be citizens of the United States, graduates of a class A medical college, and must have completed or will complete by July 1 next at least one year of internship or its equivalent. Allowances are made for internships under the accelerated training program. The compensation of officers in the grade of assistant surgeon, both regular and reserve corps, is \$3,411 per annum with dependents and \$2,975.50 per annum without dependents. The compensation of officers in the grade of passed assistant surgeon, both regular and reserve corps, is \$3,991 per annum with dependents and \$3,555.50 per annum without dependents. The board of examiners will be in the following places at 9 a. m. on the dates specified. Candidates should arrange to have their physical examination completed and prepare their autobiographies at any one of the following listed places just prior to the date shown:

U. S. Marine Hospital, Staten Island, N. Y.	January 31
U. S. Marine Hospital, Boston.	February 3
U. S. Marine Hospital, Baltimore.	February 7
U. S. P. H. S. Dispensary, 4th and D Sts. S.W., Washington, D. C.	February 9
U. S. Marine Hospital, Norfolk, Va.	February 11
U. S. Marine Hospital, Cleveland.	February 15
U. S. Marine Hospital, Chicago.	February 17
Office of Indian Affairs, 218 Federal Building, Minneapolis.	February 19
U. S. Marine Hospital, Seattle.	February 23
U. S. Marine Hospital, San Francisco.	February 28
U. S. P. H. S. Relief Station, 406 Federal Building, Los Angeles.	March 3
U. S. P. H. S. District No. 8, 617 Colorado Building, 16th and California Sts., Denver.	March 6
U. S. Marine Hospital, Kirkwood, Mo.	March 9
U. S. Marine Hospital, Louisville, Ky.	March 11
U. S. Public Health Service Hospital, Fort Worth, Texas.	March 17
U. S. Marine Hospital, Galveston, Texas.	March 20
U. S. Marine Hospital, New Orleans.	March 22
Malaria Control in War Areas Office, 605 Volunteer Building, Atlanta, Ga.	March 25
U. S. P. H. S. Relief Station, 365 Federal Building, Miami, Fla.	March 28
U. S. P. H. S. Dispensary, 4th and D Sts. S.W., Washington, D. C.	April 4

Application blanks may be obtained from the Surgeon General, U. S. Public Health Service, Washington 14, D. C. (Bethesda Station).

Foreign Letters

LONDON

(From Our Regular Correspondent)

Dec. 11, 1943.

Nutrition in Enemy Occupied Europe

At the Royal Society of Medicine a discussion took place on nutrition in enemy occupied Europe. An appalling picture was presented. Col. W. E. Vignal said that the daily ration in France yielded only 1,084 calories and was deficient in fat, protein and sugar. Tuberculosis was increasing alarmingly, and the Germans were enforcing complete silence about it. They had returned to France many tuberculous prisoners, most of them urgently needing treatment. Increasing numbers of workmen were returning from Germany to die of tuberculosis after a few months work there. France was now largely deprived of her sanatoriums and supplies, and patients had to wait six or eight months for treatment in institutions. Acute bronchopneumonic types were common, and so was rapid wasting ending in death. Many suffered from progressive asthenia and severe malnutrition. The condition of children was even more alarming. They showed a high incidence of tuberculosis. Ninety per cent of one group studied were 2 to 9 Kg. under weight. The physiologist Richet had been imprisoned for saying that 10 million persons were suffering from hunger and 2 million were likely to die.

Dr. A. P. Cawadias described famine conditions in Greece. Well to do people in Athens had 1 ounce of bread on alternate days, camomile tea and gruel, with oil and carrots and chicory coffee. Sausages of dog, rat and cat were sold at outrageous prices. The mortality was terrible; they had ceased to bother about tuberculosis, but now the incidence of malaria was 100 per cent in endemic areas, and hunger edema and other nutritional diseases were spreading.

Prof. J. Young quoted a paper by Professor Heymans of Ghent, who had been punished severely by the Nazis for publishing it. The daily basic ration was only 1,230 calories. Certain classes were allowed supplementary rations, but although rations were adequate for the younger children they were worse as age advanced. A loss of 10 to 15 Kg. in weight was common. Tuberculosis was rife and was increasing.

Treatment of Cancer of the Prostate by Synthetic Estrogens

At a meeting of the British Empire Cancer Campaign, Prof. E. C. Dodds, Courtauld professor of biochemistry in the University of London and director of the Courtauld Institute of Biochemistry, Middlesex Hospital, called attention to results obtained in treating cancer of the prostate with synthetic estrogens. As a nation, Professor Dodds stated, we could take a certain amount of credit in the discovery of this method, for, while the actual observations of cases were made by our American colleagues, the weapon which they used was forged by Englishmen working directly under the support of the British Empire Cancer Campaign. Statistics for 1941 showed that this discovery would eliminate intense suffering and death of about 4,000 persons annually in England and Wales, he said; for the first time in history it was possible to state that one form of cancer could be completely controlled and the patient rendered symptom free by giving a few pills each day. The American work had been completely confirmed here, Professor Dodds said. He warned that the discovery was confined to cancer of the prostate. Whether or not it uncovered an entirely new field of research had still to be determined, he felt, and would be investigated by those working with the support of the campaign.

The speaker indicated that it was impossible even for the average scientific worker to realize the tremendous increase in knowledge that had taken place not only during the twenty years existence of the campaign but even since the beginning of the war. The laboratory of ten years ago was almost as much out of date today as one 50 years old. The whole technic of pathology and biochemical research had been utterly changed by the introduction of new methods, Professor Dodds stated, and the technical use of the new instruments required new and deep knowledge of a most complex character.

The duke of Gloucester, brother of the king, who presided, said that the campaign would soon reach its twenty-first anniversary. During the years that he had been their president, he said, he had seen much to convince him that all associated with the campaign would some day gain their reward in the knowledge that they had contributed much toward victory in the war against cancer. He emphasized that cancer research was slow and laborious work, with little if any glamor or lime-light, but that many more young enthusiastic workers would be attracted to it were they not anxious about their daily existence. Apart from financial support of the personnel at large research centers, the campaign had always tried to encourage these young enthusiasts, and he was glad to know that generous contributors from time to time made provision for the creation of cancer research scholarships and fellowships.

Prevention of Tuberculosis in Nursing Staffs of General Hospitals

In a memorandum on the supervision of nurses' health a committee of three nursing matrons under the chairmanship of Sir Charlton Briscoe has made important suggestions on the prevention of tuberculosis among nursing staffs of general hospitals. It is pointed out that the nurse in a general hospital is not so well safeguarded against infection with tuberculosis as the nurse in a sanatorium, in which there is equipment for sterilizing sputum mugs, china and handkerchiefs, and where the nurse does much of her work in the open air. In general hospitals the new and untrained student nurse often has to handle sputum mugs, and handkerchiefs are often allowed to accumulate in a patient's locker until his relatives call for them. A sink may become contaminated if china from infectious patients is washed there.

Among the other recommendations made by the committee are the following: All nurses should be taught throughout their training by sister tutors and war sisters the precautions necessary in the nursing of the tuberculous and shown how infection is spread in respiratory conditions. They should learn how the patient can avoid distributing droplet infection, that the hands of those nursing patients with positive infection should be washed often and that no books or papers belonging to such patients should be lent to others. They should remove the overall or apron worn in the ward before going to meals. They should be encouraged to report at once any cough or respiratory infection which they notice in themselves, and especially any persistent feeling of fatigue. All nurses under 30 who are nursing tuberculous patients should be examined by x-rays at three month intervals. Every patient who is coughing up sputum should be nursed "on precautions," if possible in a separate ward, until tuberculosis is excluded. Whenever possible a boiler should be installed so that all sputum mugs can be sterilized before cleaning. The hospital should provide the patient with handkerchiefs and have special arrangements for laundering them. Bed linen should be collected and sterilized with proper precautions. Methods of sweeping and dusting around beds should be such as to avoid dissemination of infected dust. If there is no sterilizer for china, that used by tuberculous patients should be washed in a separate sink.

The Influenza Epidemic

The outbreak of an epidemic of influenza all over the country was reported in a previous letter. The epidemic began in the North, where already it shows signs of abating, although the peak does not appear to have been reached in London and the Midlands. Its development is shown by the deaths attributed to influenza in the large cities. For the weeks from November 13 to December 11 the deaths reported were respectively 46, 106, 375, 709 and 1,148. These deaths occurred mainly among the elderly. As a result the attacks have been mild with pyrexia of only three or four days and no complications. The most common complication is tracheobronchitis and, in the severe cases, bronchiolitis with patches of bronchopneumonia. This type has been responsible for deaths in young as well as old persons. The epidemic has slightly impaired the war effort. The shortage of doctors has left too few for this emergency. The government is giving help by allowing the army doctors to assist in the treatment of civilian patients as far as their military duties permit. There is also a shortage of pharmacists and dispensers, and therefore the call of these workers for war service has been temporarily suspended.

BRAZIL

(From Our Regular Correspondent)

Nov. 30, 1943.

Standardization of the Test for Latent Tuberculin Allergy in Man

Dr. Arlindo de Assis of the Viscondessa de Morais Tuberculosis Institute of Rio de Janeiro has been carrying on extensive studies of the pathogenicity of the BCG bacillus and intratuberculin allergy and has been able to establish a standard technic for the so-called Willis test. As a conclusion to his first series of studies Dr. de Assis was able to prove that during the course of the primary tuberculous infection of infancy the tuberculin allergy of the skin is established through a pre-allergic period the presence of which had not been demonstrated before. This led him to a second conclusion: that the intradermal inoculation of 0.1 mg. of heat killed BCG vaccine in children who are in the preallergic period is accompanied by specific and characteristic reactions permitting recognition of the preexistence of a virulent tuberculous infection before the appearance of cutaneous allergy and consequently of x-ray signs and clinical symptoms. Dr. de Assis's latest series of investigations has been aimed at study of the period of allergy that frequently follows the BCG vaccination at a short interval if the immunized person has the chance to escape entirely the added action of other virulent bacilli.

Forty-two children immunized by mouth with BCG were tested intradermically with old tuberculin and recognized as having lost the allergy specifically caused by vaccination after variable lengths of time. Only those children who failed to react to Mantoux tests with 10 mg. of old tuberculin were included in the study. They all have been kept under complete medical care for a long time and are recognized as free from tuberculous disease. Heat killed tubercle bacilli were injected intradermically, 0.1 mg. having been chosen as the test dose. According to previous observations an early appearance of tuberculin hypersensitiveness was checked after a fourteen day period as a routine method of detecting latent or intratuberculin allergy. Clearcut infiltrations reaching 6 mm. in diameter at the site of the inoculation were considered reliable proof of a preexisting latent allergy, as were positive tuberculin tests occurring at the beginning of the first week after the inoculation of heat killed bacilli. On the basis of such criteria, 32 children (76.2 per cent) proved to keep latent BCG allergy, although some of them had failed to react to routine tuberculin tests for seven years previously. All the children presented local infiltrative changes. General tuberculin responses were found less frequently than local ones, 16 children (50 per cent

of the positive cases) having shown positive tuberculin tests within the first week following the heat killed bacillus test. No definite relationship could be established between local changes promoted by the heat killed bacillus injection and the early causes of tuberculin hypersensitiveness. Oral revaccinations with living BCG did not exert any apparent influence on the frequency or intensity of the latent allergy. Since this kind of allergy has been frequently found in children who resisted virulent tuberculosis environments, the conclusion was drawn that the refractory status against tuberculous disease does not necessarily imply an ability to react to current tests for tuberculin hypersensitiveness. In these children the immunity to tuberculosis was rather associated with the latent allergy.

Two New Cases of Human Toxoplasmosis

Dr. Nery Guimarães of the Oswaldo Cruz Institute published recently a paper describing an established case and a suspected case of human toxoplasmosis occurring in rural sections of Brazil. With the initial work of Castellani in 1914, investigators of various countries have reported the occurrence of human toxoplasmosis, a fact that not long ago was a matter of sharp controversy. About 18 established cases were reported between 1923 and 1942 in Praga, in New York, in St. Louis, in Chicago, in Cincinnati, in Rio de Janeiro and in Amsterdam by Janku, Wolf and Cowen, Page, Sabin, Pinkerton, Torres, Wolf and De Lange, of which 10 were congenital. The symptoms presented by the patients were principally fever, convulsions, hydrocephalus, cyanosis and vomiting. Although no detailed microscopic studies have been done in all cases, the disease is characterized by granulomatous meningoencephalomyelitis (Wolf and Cowen), often associated with myocarditis and chorioretinitis. But the diagnostic sign of greatest importance is the presence of foci of profound cerebral calcification and chorioretinitis in the newborn (Wolf, Cowen and Page). Generally the disease has been encountered in towns on post-mortem examination, with subsequent hospital observations. Yet in some cases a more or less long stay in suburban and rural sections was pointed out. This fact seems to be of great epidemiologic importance. The parasite is found in a large number of animals in more or less intimate contact with man, but how the disease is transmitted to man is not established, nor is the transmission of toxoplasmas among animals known as yet. Dr. Guimarães's patient was a Negro youth of 18, an agricultural laborer, whose disease lasted twenty-seven days and was characterized by high fever, paresis of the lower limbs, nuchal rigidity, dysphasia and monocytosis. The postmortem macroscopic and microscopic examinations showed encephalitis, pericarditis, nephritis and a meningoencephalomyelitis with extensive inflammatory areas. The presence of the parasites was established. The second patient was a mulatto girl baby aged 14 months, born with hydrocephalus and presenting agitation, convulsions and tremor of the eyeballs. The x-ray examination showed typical little foci of cerebral calcification and deficient ossification of the extremities of the long bones. Toxoplasmas were isolated from guinea pigs and mice inoculated with fluid from the patient. The isolated strain appeared to be pathogenic for dogs, guinea pigs, rabbits, mice and pigeons.

Marriages

RANDOLPH CASSELLS CHARLES to Miss Harriet Winston Breeden, both of Bennettsville, S. C., November 25.

JOHN MARCUS KESTER JR. to Miss Lura Kirkland, both of Columbia, S. C., at Sumter, November 5.

E. THOMAS BRAND, Woodstock, Ill., to Mrs. Martha H. Brigham of Seneca, November 26.

DOUGLAS H. ROBERTSON to DR. RUTH F. GEISSINGER, both of New York, December 18.

Deaths

Charles Henry May ☉ New York; College of Physicians and Surgeons, New York, 1883; member of the American Academy of Ophthalmology and Otolaryngology, American Ophthalmological Society and the Association for Research in Ophthalmology, Inc.; fellow of the American College of Surgeons; specialist certified by the American Board of Ophthalmology; lecturer in diseases of the eye, New York Polyclinic, from 1887 to 1890; instructor in ophthalmology and chief of clinic at his alma mater from 1890 to 1903; served on the staffs of the Monmouth Memorial Hospital, Long Branch, N. J., French Hospital and the Mount Sinai Hospital; director and visiting surgeon, eye department, Bellevue Hospital, from 1915 to 1925 and later consulting ophthalmic surgeon; in 1914 introduced the improved system of illumination for electric ophthalmoscopes; author of "Manual of Diseases of the Eye"; recently completed revision of the eighteenth edition; the book had been translated into ten foreign languages; died December 7, aged 82, of pneumonia.

Frederick Casper Rinker ☉ Norfolk, Va.; University of Virginia Department of Medicine, Charlottesville, 1911; specialist certified by the American Board of Internal Medicine; fellow of the American College of Physicians; president-elect of the Norfolk County Medical Society; member and past president of the Southside Virginia Medical Society; formerly assistant professor of clinical medicine at the University of Wisconsin Medical School, Madison; a lieutenant in the U. S. Army during World War I; a member of the U. S. Naval Reserve; examining physician for the local board of the Selective Service System; on the staffs of the Norfolk General Hospital, Hospital of St. Vincent De Paul and the Leigh Memorial Hospital, where he died November 15, aged 58, of sclerotic heart disease.

David M. R. Culbreth, Baltimore; College of Physicians and Surgeons, Baltimore, 1883; for many years professor of botany, materia medica and pharmacognosy, Maryland College of Pharmacy, and professor of materia medica and pharmacognosy in the medical and dental departments of the University of Maryland; honorary president of the American Pharmaceutical Association, 1935-1936; member of the American Academy of Medicine and the Maryland Academy of Science; author of "Pharmaceutical Botany," "Materia Medica and Pharmacology," "Materia Medica Compend" and "University of Virginia—Memories of Her Student Life and Professors"; died October 20, aged 87.

Albert Warren Wagner, Buffalo; University of Buffalo School of Medicine, 1910; member of the Medical Society of the State of New York; also a pharmacist; served in the medical corps of the U. S. Army during World War I; medical examiner for the Cheektowaga Selective Service during World War I and recently; health officer of Cheektowaga and medical examiner for public and parochial schools for many years; on the staff of the Deaconess Hospital; died in the Veterans Administration Facility, Batavia, N. Y., November 15, aged 61, of hypertensive and coronary arterio-sclerotic heart disease.

Raymond Duane Sleight, Battle Creek, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1897; specialist certified by the American Board of Ophthalmology; member of the Michigan State Medical Society, American Academy of Ophthalmology and Otolaryngology and the Association for Research in Ophthalmology, Inc.; served in France and in the medical corps of the U. S. Army during World War I; recently examiner for the local draft board; on the staffs of the Community and the Leila Y. Post Montgomery hospitals; died December 7, aged 68, of cerebral hemorrhage.

Frank Warner ☉ Columbus, Ohio; Bellevue Hospital Medical College, New York, 1883; member of the House of Delegates of the American Medical Association in 1902 and 1903; fellow of the American College of Surgeons; at one time professor of operative and clinical surgery at the Starling Medical College; for many years a member of the state board of health; on the surgical staffs of the Grant, White Cross and Children's hospitals; trustee of the Columbus Public Library since 1910; died in the University Hospital November 28, aged 88, of heart disease.

Josiah Odin Tilton, Lexington, Mass.; University of the City of New York Medical Department, New York, 1882; member of the Massachusetts Medical Society; the first school physician in Lexington; served on the local board of health and as chairman of the Lexington park commissioners; in

1932 a bronze tablet in his honor was placed in the New England Medical Center in Boston in recognition of a "lifetime of unselfish service to the community of Lexington"; died in the Metropolitan Hospital, Waltham, December 2, aged 90, of pneumonia.

Michael Abramowicz, New York; Medizinische Fakultät der Universität, Wien, Austria, 1920; was killed December 1, aged 51, when a self-service elevator from which he was alighting suddenly started upward and crushed him.

Joseph Akerman ☉ Augusta, Ga.; Johns Hopkins University School of Medicine, Baltimore, 1900; professor of obstetrics at the University of Georgia School of Medicine; member of the South Atlantic Association of Obstetricians and Gynecologists; fellow of the American College of Surgeons; superintendent of the James Walker Memorial Hospital, Wilmington, N. C., from 1902 to 1906; from 1916 to 1917 superintendent of the University Hospital, where he had been a member of the staff; died December 9, aged 71, of heart disease.

Samuel Lane Anderson, Concordville, Pa.; Medico-Chirurgical College of Philadelphia, 1892; died November 10, aged 79.

William Clifford Bailey ☉ Decatur, Ala.; Medical College of Alabama, Mobile, 1906; on the staff of the Benevolent Society Hospital; local surgeon for the Southern Railroad; surgeon for the Southern Oil and Alabama Power Company; died recently, aged 61, of thrombosis.

William Dwight Baldwin, Makawao Maui, Territory of Hawaii; Johns Hopkins University School of Medicine, Baltimore, 1901; member of the Hawaii Territorial Medical Association; died October 31, aged 70, of coronary thrombosis.

Ira Bennett Bartle, San Luis Obispo, Calif.; Medical Department of Tulane University of Louisiana, New Orleans, 1901; member of the California Medical Association; served during World War I; president of the San Luis Obispo Rotary Club; died November 7, aged 72.

Arthur Joseph Batty ☉ Portage, Wis.; Rush Medical College, Chicago, 1906; fellow of the American College of Surgeons; veteran of the Spanish-American War and World War I; president of the First National Bank; for many years president of the chamber of commerce; on the staff of St. Savior's Hospital, where he died December 4, aged 62, of gastric hemorrhage due to ulcer.

James Bedsole, Hacoda, Ala.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1906; member of the Medical Association of the State of Alabama; died November 2, aged 72.

Edmond E. Blaauw ☉ Buffalo; Universiteit van Amsterdam Geneeskunde Faculteit, Netherlands, 1893; member of the American Academy of Ophthalmology and Otolaryngology; died December 4, aged 76, of coronary disease.

Charles H. Brobst, Peoria, Ill.; Medico-Chirurgical College of Philadelphia, 1888; member of the Illinois State Medical Society and the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; for many years on the staff of the Proctor Hospital, where he died November 25, aged 79.

Edward Morton Buck, Montrose, Iowa; Keokuk Medical College, 1896; chairman of the board of health, school examiner and president of the school board; on the staff of St. Joseph Hospital, Keokuk, where he died November 30, aged 78, of cardiac asthma.

Allen W. Budd, Canton, Ohio; Cleveland Medical College, 1880; died December 10, aged 91, of senility.

William Sabin Chase, Akron, Ohio; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1901; past president of the Summit County Medical Society; served on the staff of the City Hospital; a founder and on the staffs of the Peoples and Children's hospitals; died December 1, aged 76, of a self-inflicted bullet wound.

George Henry Cleveland, Glencoe, Ill.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1882; at one time editor of the *Clinical Review*; died in the Broadhurst Nursing Home, Evanston, December 19, aged 81, of chronic myocarditis and arteriosclerosis.

Elmer Lorenzo Crouch, Palo Alto, Calif.; Missouri Medical College, St. Louis, 1891; member of the American Psychiatric Association; served during World War I; at one time assistant physician on the staff of the Jacksonville (Ill.) State Hospital; for many years on the staff of the Veterans Administration Facility, San Francisco; died in the Palo Alto Hospital November 25, aged 74, of carcinoma.

James Francis Curry, Dunnellon, Fla.; Emory University School of Medicine, Atlanta, 1919; died in the Munroe Memo-

rial Hospital, Ocala, November 3, aged 48, of injuries received in an automobile accident.

Pierce Young Duckett, Cornelia, Ga.; University of Georgia Medical Department, Augusta, 1885; member of the Medical Association of Georgia; died in Decatur November 18, aged 81, of pneumonia.

Hiram R. Elliott Sr., Courtland, Miss.; Memphis (Tenn.) Hospital Medical College, 1900; died November 27, aged 69, of tumor of the brain.

Charles Chauncy Foster, Cambridge, Mass.; Harvard Medical School, Boston, 1883; member of the Massachusetts Medical Society; veteran of the Spanish-American War; formerly surgeon general of the commonwealth with the rank of brigadier general; served on the staff of the Cambridge Hospital; died December 2, aged 86, of diabetes mellitus.

Jacob Adam Fraunfelder * Nazareth, Pa.; Medico-Chirurgical College of Philadelphia, 1896; also a pharmacist; past president of the Northampton County Medical Society; medical examiner for the borough of Nazareth recently and during World War I; for many years physician for the borough schools; past president of the Rotary Club; died November 6, aged 71.

Fredrick George Gilbert, Rapid City, S. D.; Homeopathic Hospital College, Cleveland, 1889; died in St. John's McNamara Hospital November 14, aged 76.

Leonard Harry Green, Los Angeles; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1922; member of the California Medical Association; specialist certified by the American Board of Pediatrics, Inc.; on the staffs of the Cedars of Lebanon Hospital and the Children's Hospital; died recently, aged 46.

James Taylor Hammond, Atlanta, Ga.; University of Georgia Medical Department, Augusta, 1883; member of the Medical Association of Georgia; died in Albany November 2, aged 87.

Samuel Smith Hill * Wernersville, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1894; member of the American Psychiatric Association; formerly superintendent of the Wernersville State Hospital; for many years president of the Wernersville National Bank; died in the Reading Hospital, Reading, November 22, aged 75, of carcinoma of the stomach.

John Sutherland Hurt, Atlanta, Ga.; University and Bellevue Hospital Medical College, New York, 1903; member of the Medical Association of Georgia; died November 26, aged 66.

Wilbur Olin Jenkins * Indianapolis; Medical College of Ohio, Cincinnati, 1884; served as secretary of the city board of health and as a member of the board of public works, and safety; at one time on the staff of St. Anthony's Hospital, Terre Haute; died December 3, aged 82.

Victor Monroe Johnson, Memphis, Tenn.; Bellevue Hospital Medical College, New York, 1888; Arkansas Industrial University Medical Department, Little Rock, 1896; died December 12, aged 80, of secondary anemia.

Ellis Kackley, Soda Springs, Idaho; University of Tennessee Medical Department, Nashville, 1898; served during World War I; medical superintendent of the Caribou County Hospital; died November 22, aged 72.

William E. Lawson, Homestead, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1897; formerly member of the school board; on the staff of the Homestead Hospital; died November 26, aged 71, of coronary occlusion.

Wesley P. Lewallen, Canadian, Okla.; Kentucky School of Medicine, Louisville, 1901; died October 18, aged 81.

Elverton E. Major, Los Angeles; Rush Medical College, Chicago, 1878; died November 12, aged 89.

James Ragan McEachern * Tampa, Fla.; Atlanta College of Physicians and Surgeons, 1902; served as president of the Florida Public Health Association; at one time a member of the city council of Monticello, a member of the state senate and legislature; served in the medical corps of the U. S. Army in France during World War I; health officer of Tampa; died suddenly in November, aged 70.

John Seaborn McKenzie, Miami, Fla.; Louisville (Ky.) Medical College, 1892; died in a local hospital October 17, aged 77.

John J. McShane, Springfield, Ill.; Rush Medical College, Chicago, 1903; member of the Illinois State Medical Society; chief of the division of communicable diseases, state department of public health; at one time a member of the health department

of Chicago and health commissioner of Kenosha, Wis.; died in St. John's Hospital December 14, aged 65, of cerebral hemorrhage.

B. B. Meroney, Murphy, N. C.; Gate City Medical College, Texarkana, Ark., 1906; died in a local hospital November 19, aged 77.

John Sewall Milliken * Portland, Maine; Medical School of Maine, Portland, 1900; served during World War I; died in the Maine General Hospital recently, aged 67, of chronic rheumatic heart disease.

Henry Pinckney Moore, Orangeburg, S. C.; Medical College of the State of South Carolina, Charleston, 1912; served during World War I; on the staff of the Tri-County Hospital; died December 9, aged 56, of coronary thrombosis.

Donn Piatt Murray * Dunkirk, Ind.; Medical College of Indiana, Indianapolis, 1894; a director and vice president of the First State Bank of Dunkirk; for many years president of the school board; on the staffs of the Jay County Hospital, Portland, and the Ball Memorial Hospital, Muncie, where he died November 9, aged 73.

Stephen Dixon Naylor, Stephenville, Texas; Medical Department of Tulane University of Louisiana, New Orleans, 1890; member, and vice president 1928-1929, State Medical Association of Texas; served as medical examiner of cadets at John Tarleton College; for many years a member of the board of directors of the chamber of commerce; died in a local hospital October 17, aged 77, of cerebral hemorrhage.

Lera Page, Rutherford, Tenn. (licensed in Tennessee in 1913); served as postmaster; died November 25, aged 68.

Harry Middleton Parker, Wedgefield, S. C.; Medical College of the State of South Carolina, Charleston, 1913; member of the South Carolina Medical Association; served during World War I; died November 29, aged 59.

Jefferson Thompson Parks Jr., Oklahoma City; University of Oklahoma School of Medicine, Oklahoma City, 1943; died in the Wesley Hospital November 11, aged 34, of pulmonary tuberculosis.

Roger V. Parlett, Tucson, Ariz.; University of Maryland School of Medicine, Baltimore, 1912; served overseas during World War I; served as physician and surgeon for the Sundt Construction Company; at one time associated with the Indian Service and U. S. Public Health Service; died in St. Mary's Hospital November 6, aged 55, of uremia.

James Denham Pasco, Jacksonville, Fla.; University of Virginia Department of Medicine, Charlottesville, 1906; member of the Florida Medical Association; on the staffs of the Riverside Hospital and the Church Home for Boys; died November 12, aged 60, of perforating ulcer of stomach.

Harold Foster Port * Titusville, Pa.; University of Pittsburgh School of Medicine, 1928; served overseas during World War I; a member of the local board of health; on the staff of the Titusville Hospital; died November 13, aged 49.

Joseph Charles Pothier * New Bedford, Mass.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1887; formerly a member of the school committee; on the courtesy staff, St. Luke's Hospital; died December 1, aged 78, of coronary infarct.

Elmer John Presper, Philadelphia; University of Pennsylvania School of Medicine, Philadelphia, 1912; member of the Medical Society of the State of Pennsylvania; served overseas during World War I; medical examiner for the civil service commission for many years; on the staffs of St. Mary's and St. Christopher's hospitals; died in the U. S. Naval Hospital December 2, aged 52, of cirrhosis of the liver.

Coleman Bernard Ransone * Roanoke, Va.; Medical College of Virginia, Richmond, 1915; health commissioner of Roanoke; at one time health officer of Newport News; served in the U. S. Navy from 1917 to 1920; died December 3, aged 56, of coronary thrombosis.

Arthur Earnest Rogers, Jacksonville, Fla.; Rush Medical College, Chicago, 1897; served during World War I; died in the Veterans Administration Facility, Bay Pines, November 15, aged 73, of acute bronchopneumonia.

Clarence Otis Sansing * Houston, Texas; Baylor University College of Medicine, Dallas, 1926; for many years lieutenant in the medical reserve corps of the U. S. Army; served on the staffs of the Hermann Hospital, St. Joseph's Infirmary, Memorial Hospital, Jefferson Davis Hospital and the Methodist Hospital; died November 17, aged 45, of coronary occlusion.

William Frederick Schenk, New Corydon, Ind.; Curtis Physio-Medical Institute, Marion, 1896; served as a member

of the local board of health; for many years member of the state legislature; director of the Bank of Geneva; died in the Adams County Memorial Hospital, Decatur, November 28, aged 77, of hemorrhage due to ruptured aneurysm.

Minnie Myrtle Seiler, Fort Myers, Fla.; Woman's Medical College of Baltimore, 1904; died November 14, aged 65.

Daniel Anderson Simmons * Roseville, Ill.; University of Illinois College of Medicine, Chicago, 1929; local health officer; on the staff of the Monmouth Hospital, Monmouth; died in the University Hospital, Chicago, November 18, aged 39, of respiratory failure following a nephrectomy.

George Wallace Simrell, Brooklyn; Long Island College Hospital, Brooklyn, 1899; also a pharmacist; member of the Medical Society of the State of New York; served in the medical corps of the U. S. Army during World War I; formerly on the staffs of the Swedish, Caledonian and Midwood hospitals; died in the Veterans Administration Facility, Northport, N. Y., November 30, aged 74, of chronic myocarditis.

Edward A. Smith * Baltimore; Baltimore Medical College, 1891; died November 1, aged 81, of chronic myocarditis.

William A. Smith, Madison, Va.; University of Maryland School of Medicine, Baltimore, 1880; member of the Medical Society of Virginia; died November 10, aged 88, of senility.

William Edgar Sperow, Carlisle, Iowa; University of Maryland School of Medicine, Baltimore, 1894; member of the Iowa State Medical Society; on the staff of the Iowa Lutheran Hospital, Des Moines; died in the Iowa Methodist Hospital, Des Moines, November 10, aged 72, of heart disease.

Charles Abraham Spivacke * New York; Cornell University Medical College, New York, 1899; member of the American Association for the Study of Allergy; a founder and director of the allergy clinic, Lebanon Hospital dispensary; died November 21, aged 66.

Walter Thomas Stenson * New York; McGill University Faculty of Medicine, Montreal, Que., Canada, 1922; specialist certified by the American Board of Surgery; fellow of the American College of Surgeons; served during World War I; on the surgical staff of the Lenox Hill Hospital; died in Punta Gorda, Fla., December 8, aged 48, of acute pulmonary congestion and coronary thrombosis.

Daniel Boone Stone, Smiths Grove, Ky.; University of Tennessee Medical Department, Nashville, 1888; member of the Kentucky State Medical Association; died November 6, aged 83.

Arthur MacMahan Sullivan, South Bend, Ind.; Indiana University School of Medicine, Indianapolis, 1909; member of the Indiana State Medical Association; died November 27, aged 62.

Louie P. Tessier, Augusta, Ga.; University of Georgia Medical Department, Augusta, 1896; served as city physician; formerly a druggist; died November 27, aged 71.

Constantine Theodore, Chicago; National University of Athens School of Medicine, Greece, 1902; member of the American Association of Railway Surgeons; a member of the Selective Service Board number 3; on the staff of the Illinois Central Hospital; founder and organizer of the Greek Grammar School at St. Constantine Church; for twenty-eight years Cook County jail physician; past president of the Greek Professional Mens Club; died November 24, aged 64, of chronic myocarditis and chronic bronchiectasis.

Clive Wylie Thompson, Cleveland; University of Wooster Medical Department, Cleveland, 1907; member of the Ohio State Medical Association; veteran of the Spanish-American War and World War I; served on the staffs of the Huron Road Hospital, East Cleveland, and St. Luke's Hospital; died November 7, aged 64, of coronary occlusion.

David Orval Thompson, Sycamore, Ill.; Chicago Medical School, 1923; member of the Illinois State Medical Society; a director of the Illinois Tuberculosis Association and the De Kalb County Tuberculosis Association; on the staffs of the De Kalb Public and St. Mary's hospitals, De Kalb, and the Sycamore Municipal Hospital; a member of the chamber of commerce; died November 6, aged 60, of coronary thrombosis.

Charles Ethelbert Triplett, Morocco, Ind.; Rush Medical College, Chicago, 1895; died November 25, aged 81, of carcinoma of the prostate and bladder.

Charles Sutton Trites, Napanoch, N. Y.; Hahnemann Medical College and Hospital of Philadelphia, 1896; member of the American Psychiatric Association; on the staff of the Institution for Male Defective Delinquents; at one time staff psychiatrist, Auburn Prison, Auburn; died in the Veterans Memorial Hospital, Ellenville, December 7, aged 68, of pneumonia.

Herman H. Tuttle, Springfield, Ill.; Keokuk (Iowa) Medical College, 1894; cited for gallantry in action in World War I; at one time health officer of Springfield; died in the Veterans Administration Facility, Downey, December 9, aged 72, of chronic myocarditis with myocardial degeneration and general arteriosclerosis.

William Alva Van Wart, Cherryfield, Maine; Bellevue Hospital Medical College, New York, 1893; died November 2, aged 75.

Benjamin S. Walker, Corydon, Iowa; Keokuk Medical College, College of Physicians and Surgeons, 1900; member of the Iowa State Medical Society; served during World War I; a member of the town council, school board and Rotary Club; on the staff of the Corydon Hospital; died November 2, aged 70, of hypertension and cerebral hemorrhage.

Horace Seeley Warner, Thomaston, Conn.; College of Physicians and Surgeons, New York, 1884; member of the Medical Society of the State of New York; for many years medical referee of the Aetna Life Insurance Company, New York; died November 30, aged 85, of myocarditis.

Richard Cornell Warren * Ithaca, N. Y.; Cleveland Homeopathic Medical College, 1903; veteran of the Spanish-American War; on the staff of Tompkins County Memorial Hospital; died December 15, aged 69, of coronary thrombosis.

Albert G. Wilkinson, Wayne, W. Va.; Louisville (Ky.) Medical College, 1893; president of the Wayne County Bank; county health officer; died November 29, aged 77, of heart disease.

Albert Ross Wilsey, Breckenridge, Mo.; St. Louis University School of Medicine, 1902; served during World War I; died in the Missouri Methodist Hospital, St. Joseph, November 7, aged 70, of strangulated hernia and intestinal obstruction.

Peter Joseph Wollersheim, Forest Junction, Wis.; Marquette University School of Medicine, Milwaukee, 1928; member of the State Medical Society of Wisconsin; on the staffs of St. Vincent's and Bellin Memorial hospitals, Green Bay; died in Stevens Point November 28, aged 48, of pneumonia.

John Henry Young * Lemongrove, Calif.; Ohio Medical University, Columbus, 1900; fellow of the American College of Surgeons; attending obstetrician and gynecologist, San Diego County and Mercy hospitals, San Diego, and Scripps Memorial Hospital, La Jolla; died October 14, aged 70, of a self-inflicted bullet wound.

Edward Anthony Zaworski * Minneapolis; John A. Creighton Medical College, Omaha, 1911; served as vice president of the Northeast State Bank; medical examiner for the northeast section draft board; died November 25, aged 58, of coronary heart disease and hypertension.

KILLED IN ACTION

Charles Frederick Pecoraro, Somerville, Mass.; College of Physicians and Surgeons, Boston, 1937; captain, medical corps, Army of the United States and was assigned to the medical detachment, 532d Engineer Regiment; died in the southwest Pacific area September 25, aged 35, of wounds received in action.



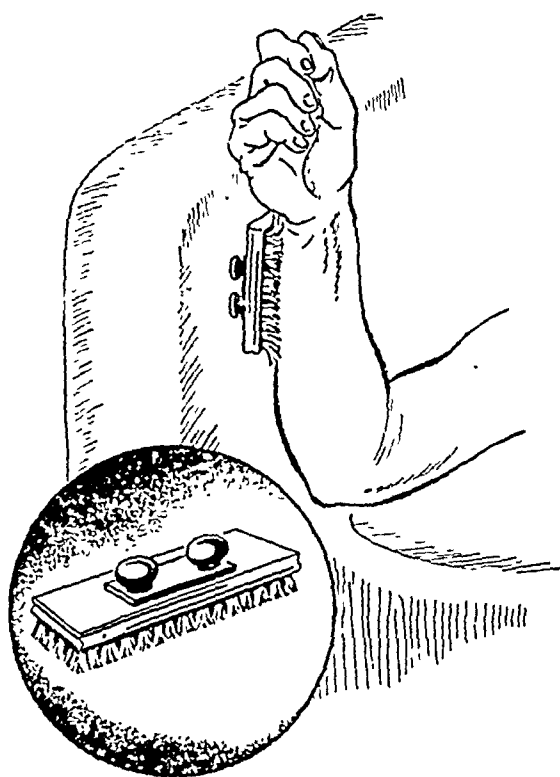
CAPT. CHARLES F. PECORARO
M. C., A. U. S., 1908-1943

Correspondence

DEVICE TO AID WASHING OF HAND BY PATIENT WITH AMPUTATED ARM

To the Editor.—Recently, without thinking, I told a one armed man who was in my office to wash his hand. He replied "How would I do it?" Obviously his plight is similar to the plight of many others and there probably will be many more when the casualties of the war come back. I am sending you a brush which I have prepared for the use of this patient. I have never seen or heard of any similar device nor have my friends who have seen it.

I would appreciate your publishing a picture of this simple, inexpensive and, above all, very efficient device, which the patient can carry with him and use at any time or place. The little rubber vacuum cups are still available in Indianapolis in



Brush fitted with vacuum cups.

limited quantities and if the brush would meet any great demand it probably could be manufactured economically by a large manufacturer of brushes.

The idea is simply to attach two rubber vacuum cups to any brush. As far as I know, this particular use of the vacuum cup is new and I hope the idea will be of value to the unfortunate cripples who need it.

JOHN R. BRAYTON, M.D., Indianapolis.

LEPROSY

To the Editor.—Careful reading of a recent article by Frazier (Leprosy, Epidemiology and Natural History, *THE JOURNAL*, Oct. 23, 1943, p. 466) leaves me a bit bewildered. Why was it written? For the worker in leprosy who is familiar with the literature it contains nothing new, although some points are controversial, such as his statements regarding transmission. If it is for the general practitioner or dermatologist who may see an occasional case of leprosy, it is dangerous. Here are my reasons:

The section on natural history is true for the most part but ignores the accepted classification which is the basis for diagnosis, study and prognosis (The Cairo Congress, Report of the Subcommittee on Classification, *Internat. J. Lep.* 6:389 [July-Sept.] 1938). One might think from Frazier's discussion that lesions may shift from tuberculoid to lepromatous and back to simple neural. This simply does not happen or, if it does, it is so rare that it has not to my knowledge been reported.

Regarding examination for *Mycobacterium leprae*, he states "Fixed tissue preparations of skin and lymph node are best for this purpose." Fixed skin preparations are of value only when bacilli are extremely scanty. Lymph node preparations are of much less value because of the difficulty in identifying bacilli found there as *M. leprae*. But in all lepromatous cases, and probably in the majority of cases in which bacilli will be demonstrated, Wade's "scraped incision" method is quite satisfactory (Wade, H. W.: *The Bacteriological Examination in Leprosy*, *Lep. Rev.* 6:54, 1925). Moreover, in simple leprids one does not expect to find bacilli except, perhaps, in the nerves.

Today millions of young Americans are going into regions where leprosy is endemic, and the experience of the Philippine campaigns of the Spanish-American War is likely to be repeated on a larger scale. All the members of our armed forces should realize that leprosy, which may be unrecognized but contagious, is abundantly present in Polynesia, China, the Philippines, the East Indies, Thailand, Burma, India, Arabia, central and northern Africa, and even to some extent in southern Europe. Medical officers should be familiar with early symptoms of the disease in order to protect their troops as much as possible; but the general practitioner who five or ten years from now will see the returned soldier who begins to show signs of leprosy should also be able to recognize and diagnose the condition. Teach the medical profession to suspect and to diagnose leprosy; further study and treatment, if any, may well be left to special workers in that field.

NORMAN R. SLOAN, M.D., Kalaupapa, Molokai, T. H.
Medical Director.

POSTURE DURING EXAMINATION OF HEART

To the Editor.—In the Nov. 13, 1943 issue of *THE JOURNAL* a clinical note appeared with reference to posture during examination of rapid heart by Dr. L. S. Luton of St. Louis. The author states that it was "something new to him" when he noticed that a tachycardia in a patient he had been examining had abruptly terminated on the patient bending forward.

In a paper on "Paroxysmal Auricular Flutter of 1:1 Ratio," page 955 of Vol. 8 of the *Annals of Int. Med.* 1935, I quoted a communication from the patient under study for this condition in which he stated that he was able "to ward off an attack of the extremely rapid type by bending forward when the heart seemed undecided whether to go back on its regular beating or to take up the very fast palpitating route." This patient used to have attacks of tachycardia of 240 rate which was considered to be auricular flutter of 1:1 ratio.

On many occasions I have observed that patients subject to such paroxysms knew how to terminate such attacks by "doubling up on themselves" or "squatting down."

HYMAN ARENBERG, M.D.,
U. S. Marine Hospital,
New York.

HYPOGLYCEMIC ACTION OF NICOTINIC ACID

To the Editor:—THE JOURNAL, Nov. 27, 1943 contains an abstract of an article by F. J. Neuwahl on the hypoglycemic action of nicotinic acid (*Lancet* 2:348 [Sept. 18] 1943). The following quotation is taken from an abstract of my report made at the meeting of the American Physiological Society in the spring of 1935 at Detroit and published in September of the same year in the proceedings: "Nicotinic acid exerted a mild hypoglycemic action. . . . In all cases an increase of muscular sensitivity, decrease of body temperature and slowing of heart beat were noted. The hypoglycemic action of nicotinic acid was most pronounced in turtles."

EPHRAIM B. BOLDYREFF, M.D.,
Butterworth Hospital,
Grand Rapids, Mich.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

NATIONAL BOARD OF MEDICAL EXAMINERS
EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, Jan. 15, page 188.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, Feb. 21-24. Sec., Dr. B. F. Austin, 519 Dexter Ave., Montgomery.

ARKANSAS: * March. Sec., Dr. D. L. Owens, Harrison.

COLORADO: * Denver, April 4-7. Sec., Dr. J. B. Davis, 831 Republic Bldg., Denver.

CONNECTICUT: * Medical, Written, Hartford, March 14-15. Endorsement, New Haven, March 28. Sec. to the Board, Dr. Creighton Barker, 258 Church St., New Haven. Homoeopathic, Derby, March 13-14. Sec., Dr. J. H. Evans, 1488 Chapel St., New Haven.

FLORIDA: * Jacksonville, June 26-27. Sec., Dr. W. M. Rowlett, Box 786, Tampa.

INDIANA: Indianapolis, May 2-4. Sec., Board of Medical Registration and Examination, Dr. W. C. Moore, 301 State House, Indianapolis.

KANSAS: Kansas City, Feb. 2-3. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. Seventh St., Kansas City.

MAINE: Portland, March 14-15. Sec., Board of Registration of Medicine, Dr. A. P. Leighton, 192 State St., Portland.

MASSACHUSETTS: Boston, March 14-17. Sec., Board of Registration in Medicine, Dr. H. Q. Galluppe, 413-F State House, Boston.

MISSOURI: Reciprocity, Jefferson City, Jan. 24. Sec., State Board of Health, Dr. James Stewart, State Capitol Bldg., Jefferson City.

MONTANA: Helena, April 3-5. Sec., Dr. O. G. Klein, First National Bank Bldg., Helena.

NEVADA: Endorsement, Carson City, Feb. 7. Sec., Dr. G. H. Ross, 215 N. Carson St., Carson City.

NEW HAMPSHIRE: Concord, March 9-10. Sec., Board of Registration in Medicine, Dr. D. G. Smith, State House, Concord.

NEW JERSEY: Feb. 15-16. Sec., Dr. E. S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO: * Santa Fe, April 10-11. Sec., Dr. LeGrand Ward, 141 Palace Ave., Santa Fe.

NEW YORK: Albany, New York, Buffalo and Syracuse, Jan. 24-27. Sec., Dr. R. R. Hannon, Education Bldg., Albany.

OHIO: Endorsement, Columbus, Feb. 7. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

OREGON: * Portland, Jan. 26-29. Exec. Sec., Miss L. M. Conlee, 608 Failing Bldg., Portland.

RHODE ISLAND: * Providence, April 6-7. Chief, Division of Examiners, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

WYOMING: Cheyenne, Feb. 7-8. Sec., Dr. M. C. Keith, Capitol Bldg., Cheyenne.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

COLORADO: Denver, March 8-9. Sec., Dr. E. B. Starks, 1459 Ogden St., Denver.

CONNECTICUT: Feb. 12. Address State Board of Healing Arts, 250 Church St., New Haven.

DISTRICT OF COLUMBIA: Washington, April 17-18. Sec., Commission on Licensure, Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington.

FLORIDA: Gainesville, June 8. Sec., Dr. J. F. Conn, John B. Stetson University, DeLand.

NEW MEXICO: Feb. 7. Sec., Miss Pia Joerger, State Capitol, Santa Fe.

OREGON: Portland, March 4. Sec., Board of Higher Education, Mr. C. D. Byrne, University of Oregon, Eugene.

RHODE ISLAND: Providence, Feb. 16. Chief, Division of Examiners, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

SOUTH DAKOTA: Vermillion, June 4-5. Sec., Dr. G. M. Evans, Yankton.

WISCONSIN: Madison, April 1. Sec., Prof. R. N. Bauer, 152 W. Wisconsin Ave., Milwaukee.

Bureau of Legal Medicine
and Legislation

MEDICOLEGAL ABSTRACTS

Optometry Practice Acts: Practice by Optometrist as Employee of Corporation "Unprofessional Conduct."—Lieberman, who was licensed to practice optometry in Connecticut, occupied rooms in a department store and examined persons seeking optometrical services, making no charge for his services if the person he examined and prescribed for purchased in the store the glasses prescribed but otherwise charging a fee that was turned over to the corporation conducting the store. He was paid a salary by the corporation and also received commissions on optical goods sold on his prescription. The corporation advertised extensively regarding the optometrical services available at its store, in which advertisements Lieberman's name, if it appeared at all, appeared relatively inconspicuously. These advertisements reasonably left the impression in the minds of the readers that the corporation was offering to render optometrical services or, at least, that the corporation was responsible for the way and manner in which they were rendered. The Connecticut state board of examiners in optometry, after notice and hearing, revoked Lieberman's license to practice optometry on the ground that his practice under the circumstances stated constituted "unprofessional conduct," which under the Connecticut optometry practice act is sufficient grounds for the revocation of a license to practice optometry. Lieberman, in effect, appealed to the superior court, Hartford County, which restored his license, and the state board of examiners appealed to the Supreme Court of Errors of Connecticut.

This court, said the Supreme Court of Errors, construed the words "unprofessional conduct" as used in the optometry practice act in *Sage-Allen Co., Inc. v. Wheeler*, 119 Conn. 667, 179 A. 195, 98 A. L. R. 897, where we said:

The words must have been used in the light of the fundamental purpose of the statutes to regulate the profession in the public interest and they can only be construed as intending to include conduct within their fair purport which either shows that the person guilty of it is intellectually or morally incompetent to practice the profession or has committed an act or acts of a nature likely to jeopardize the interest of the public.

The question presented by this case is whether on the facts Lieberman could reasonably be held to be guilty of conduct "of a nature likely to jeopardize the interest of the public." In determining this question the court considered the various optometry practice acts that have been enacted in Connecticut and concluded that there has been in those acts a growing recognition of the importance of regulating optometry and a recognition that a calling that was originally regarded as a trade has increasingly taken on the aspects of a learned profession. No doubt, said the court, this recognition is due to a greater realization by the legislature and the public of the fact we stated in the *Sage-Allen* case, supra; as follows:

It is a matter of common knowledge that where a person suffers from defective vision the use of eyeglasses not correctly adapted to remedy the defect may seriously aggravate it and, because of the resultant eye strain, may bring about nervous and even physical disorders, with accompanying discomfort and loss of efficiency.

To this statement, continued the court, we add that a properly qualified optometrist should be able often to discover disease conditions of the eye which require treatment by an oculist and should, when they are discovered, refer his patient to a physician qualified to deal with them.

Lieberman apparently contended that his practice under his arrangement with the department store did not constitute unprofessional conduct because such an arrangement was permitted by the optometry practice act. The optometry practice act in effect when the *Sage-Allen* case, supra, was decided, said the court, provided, so far as is here pertinent, that "Nothing herein contained shall prohibit the operation in a department store of an optical department under the supervision of a duly licensed optometrist." By an amendment enacted in 1939 this

sentence was eliminated and the following was substituted: "No person except a licensed optometrist shall operate an optometrical office. Nothing herein contained shall be construed as prohibiting the conducting of clinics or visual surveys when they are conducted without profit." It is not easy to determine the purpose designed to be accomplished by this 1939 amendment, but we need not consider that question in its broad aspects. As was said in the Sage-Allen case, *supra*, the sentence in the law that was in effect before the 1939 amendment made it possible for a department store to conduct an optical department and employ a licensed optometrist in connection with it. It did not, in its terms or by necessary implication, authorize a department store to establish in connection with its business an office designed solely to render optometrical service and held out to the public as a place to which they might resort for such service, regardless of the relationship between a licensed optometrist in charge of such an office and the management of the store. As we said in that case, there is a distinction as regards the attention which the public is entitled to expect between a situation where an optical department in a store is in charge of a licensed optometrist and one where it is in charge of a layman, as in the former a customer visiting the department expects to receive the advice and assistance of a trained optometrist, assistance which he does not expect in the latter case. So there is a distinction as regards the rightful expectations of the public between a situation where an optometrist is merely in charge of an optical department and one where, in connection with the business of the store, a department store maintains a separate office in which an optometrist renders and is held out to the public as rendering the usual services of a licensed optometrist. Certainly the amendment of 1939 cannot be held to broaden the rights of those conducting stores where optical goods are sold so as to authorize them under any and all circumstances to have in connection with them an office where optometrical services are rendered.

While it may be true, continued the court, that the standards of professional conduct which should govern the practice of optometry are not in all respects the same as those which govern the practice of a physician, still in view of the recognized character that optometry has today there are certain fundamental requirements common to both the practice of optometry and the practice of medicine. One of these is that the patient who resorts to an optometrist for advice and help is entitled to the same undivided loyalty that he should receive from a physician. As was said in *Rowe v. Burt's Inc.*, Ohio App., 31 N. E. (2d) 725:

Professionally, an optometrist should have no interest in any way in who fills his prescriptions. It is manifestly apparent that the situation here prevailing cannot permit the freedom in the optometrists which should exist in purely professional men.

That reasoning, we take it, was the basis of the decision of the Supreme Judicial Court of Massachusetts in *McMurdo v. Getter*, 298 Mass. 363, 10 N. E. (2d) 139, where it was held that a firm which availed itself of the services of a licensed optometrist was to be regarded as practicing optometry, although the test usually employed in determining whether an agency exists was not met. The court there said that employees of corporations, "though professionally trained and duly licensed to practice, owe their primary allegiance and obedience to their employer rather than to the clients or patients of their employer," and the principle which forbids a licensed member of a profession to practice among the public as the employee of an unlicensed person or corporation "recognizes the necessity of immediate and unbroken relationship between a professional man and those who engage his services." While, continued the court, under the facts in this case it might not be concluded reasonably that Lieberman was the agent or employee of the corporation, the vice of the situation lies in the particular relationship existing between Lieberman and the corporation and certain circumstances resulting from the arrangements between them. The fact that a considerable part of the compensation received by Lieberman came from com-

missions received from the corporation based on the sale of glasses prescribed by him, if such a practice were held generally permissible, would make it likely, at least in some instances, that the welfare of the patient would not be the sole criterion applied by the optometrist in rendering services to him. Also, because the profit to the store from the arrangement would come entirely from its sale of optical goods, an optometrist under such an arrangement as the one before us, in order to preserve his position with the corporation, might well be tempted to prescribe glasses or more expensive glasses when this would not serve true interests of the patient. The situation is one where the complete loyalty of an optometrist to his patient is put into serious jeopardy.

The state board of examiners in optometry concluded that the arrangement between Lieberman and the corporation amounted to a splitting of fees, forbidden by one of its regulations. Splitting of fees, said the court, as defined in the statutes of several states occurs where a member of a profession divides the compensation he receives from a patient with another member of the same profession or any person who has sent the patient to him or has called him into consultation. It may be that Lieberman could not be charged with a splitting of fees in the usual understanding of the offense. However that may be, where an optometrist working under such an arrangement as was Lieberman is not compensated for his services by a patient who buys glasses in the store, but only by the salary and commissions paid to him by the corporation with which he is connected, and where, if the patient does not buy glasses in the store, the compensation the optometrist receives is turned over to the corporation, the practice might well impair the personal responsibility of the optometrist to his patients, which is one of the safeguards of the proper rendition of services by a member of a profession.

The court then considered the advertising of optometrical services by the corporation. The advertisements, the court held, could reasonably be regarded as creating in the public mind the impression that it was the corporation which was offering to render optometrical services, or at least it was the corporation which was responsible for the way and manner in which they were rendered. An optometrist, said the court, is not forbidden to advertise; a physician may do so provided his advertisement is not "deceptive, misleading, extravagant, improbable or untrue." General Statutes, Sup. 1941, sec. 475f. Certainly an optometrist can be held to no higher standard of conduct. But to become a party to a type of advertising such as here involved may well be regarded as "unprofessional conduct" in that it leads the public into an erroneous conception of the respective responsibilities of the corporation and the plaintiff.

The court accordingly concluded that the state board of examiners in optometry from the evidence before it could reasonably find proved the charge that Lieberman was guilty of unprofessional conduct. Accordingly the court affirmed the action of the board in revoking Lieberman's license to practice optometry.—*Lieberman v. Connecticut State Board of Examiners in Optometry*, 34 A. (2d) 213 (Conn., 1943.)

Society Proceedings

COMING MEETINGS

- Annual Congress on Industrial Health, Chicago, February 15-16. Dr. Carl M. Peterson, 535 N. Dearborn St., Chicago 10, Secretary.
- Annual Congress on Medical Education and Licensure, Chicago, February 14-15. Dr. Victor Johnson, 535 N. Dearborn St., Chicago 10, Secretary.
- American Academy of Orthopaedic Surgeons, Chicago, January 22-26. Dr. Myron O. Henry, 825 Nicollet Ave., Minneapolis, Secretary.
- Clinical Orthopaedic Society, Chicago, January 22-26. Dr. Myron O. Henry, 825 Nicollet Ave., Minneapolis, Secretary.
- Society of Surgeons of New Jersey, Atlantic City, January 29. Dr. Walter B. Mount, 21 Plymouth St., Montclair, N. J., Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1934 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis

26:435-576 (Oct.) 1943

- Mechanism of Auricular Paroxysmal Tachycardia. P. S. Barker, F. N. Wilson and F. D. Johnston.—p. 435.
Paroxysmal Supraventricular Tachycardia with A-V Block. G. M. Declercq Jr., G. R. Herrmann and E. H. Schwab.—p. 446.
Normal Human Ventricular Gradient: III. Relation Between Anatomic and Electrical Axes. R. Ashman, M. Gardberg and E. Byer.—p. 473.
Id.: IV. Relationship Between Magnitudes Aqns and G and Deviations of RS-T Segment. R. Ashman.—p. 495.
Anomalous Origins of Posterior Inter-costal Arteries from 915 Thoracic Aortas: Their Role in Fractures of Ribs. Myrtelle M. Canavan.—p. 511.
Atrial Septal Defect: Report of 2 Cases in Which There Was Recurrent Laryngeal Nerve Paralysis. H. Erlanger and S. A. Levine.—p. 520.
Basal Metabolic Rate in Essential Hypertension. G. E. Mountain, E. V. Allen and S. F. Haines.—p. 528.
Relative Clinical Potency of Digitalis U. S. P. X, Digitalis U. S. P. XI and Digilamid. L. B. Laplace.—p. 536.

American J. Digestive Diseases, Fort Wayne, Ind.

10:407-442 (Nov.) 1943

- *Treatment of Amebic Dysentery. H. W. Soper.—p. 407.
Treatment of Peptic Ulcer. H. W. Soper.—p. 408.
*Peptic Ulcer at Fort Sill. R. C. Kirk.—p. 411.
Vitamins in Gastrointestinal Disease. L. Pelnar.—p. 414.
Modern Explanation of Gastric Emptying Mechanism. J. P. Quigley.—p. 418.
Tuberculosis of Buccal Mucous Membrane. A. V. Weinberger.—p. 421.
For Better Nutrition. Alice R. Bernheim.—p. 425.
Psychologic Problems in Hypoglycemia. J. Wilder.—p. 428.
Effect of Liver Fraction of Duodenal Drainage on Certain Forms of Animal and Vegetable Life. M. E. Rehfuess and T. Williams.—p. 435.

Treatment of Amebic Dysentery.—Soper began intravenous administration of emetine in amebic dysentery twenty years ago. He saw many early cases, made daily proctosigmoidoscopies and demonstrated the acute early lesions, which disappeared after the third or fourth intravenous injection of emetine. Seven consecutive daily doses were given, followed by a seven day course of acetarsone, consisting of one 0.25 Gm. tablet three times daily before meals. No toxic symptoms were observed after the emetine injections. It was always given slowly, with the patient lying down. The author had but one recurrence in a series of 302 cases. In earlier years he had given emetine in advanced cases with deep ulcerations over a period of three or four weeks and had seen toxic symptoms. This convinced him that the failure of emetine to cure the chronic carrier was due to the induration surrounding the ulcer, which acted as a barrier. Intravenous administration of emetine is highly specific for patients not in the carrier stage. It reaches the entire circulatory area in a more concentrated form than when given subcutaneously. Hepatic and pulmonary abscesses occur often in late neglected cases. Abscesses in the brain, skin, lymph glands and bladder have been reported. The late ulcerative lesions in the colon are intractable to treatment. The ulcers are frequently connected by sinuses beneath a still intact mucous membrane. The author advises chiniofon as the drug of choice in the treatment of carriers. It is given in 0.25 Gm. tablets three to four times daily (adult dosage) for a period of eight to ten days.

Peptic Ulcer.—According to Kirk peptic ulcer assumes the leading role in digestive diseases in the military service. It leads all other gastrointestinal conditions as a cause for discharge from the army. The present study was made during

the period from Oct. 1, 1942 to March 1, 1943. During this time 385 patients were admitted to the gastrointestinal section for study. Of these 385 men 50, or 12.9 per cent, were found to have peptic ulcer on clinical observation with x-ray examination. No correlation has been obtained between the gastric analysis and the severity of the ulcer complaints. Midepigastric pain occurring late at night and radiating into the back appears pathognomonic of duodenal ulcer. Intolerance to greasy foods on the part of these patients seems to be the greatest obstacle to military service. The emotional concept of the genesis of ulcer is not supported by the reported cases.

American Journal of Physiology, Baltimore

140:125-286 (Nov.) 1943. Partial Index

- Mucus, Acid and Water Secretion in Stomach Following Injection of Pilocarpine. F. Hollander and J. Stein.—p. 136.
Comparison of Configuration in Electrocardiogram of Endocardial and Epicardial Extrasystoles. H. E. Hoff and L. H. Nahum.—p. 148.
Renal Reabsorptive Mechanism in Dog Common to Glycine and Creatine. R. F. Pitts.—p. 156.
Rapid Acclimatization to Work in Hot Climates. S. Robinson, E. S. Turrell, H. S. Belding and S. M. Horvath.—p. 168.
Consecutive Changes in Cutaneous Blood Flow, Temperature, Metabolism and Hematocrit Readings During Prolonged Anesthesia with Morphine and Barbitol. H. D. Green, N. D. Nickerson, R. N. Lewis and B. L. Brofman.—p. 177.
Metabolism of Perfused Dog's Brain. C. A. Handley, H. M. Sweeney, Q. Scherman and R. Severance.—p. 190.
Effectiveness of Plasma, Gelatin and Saline Transfusions in Preventing Shock Induced by Leg Muscle Trauma and Tourniquets. W. Kleinberg, J. W. Remington, W. J. Eversole, R. R. Overman and W. W. Swingle.—p. 197.
Eccentricity of Standing and Its Cause. F. A. Hellebrandt, Bette G. Nelson and Eleanor M. Larsen.—p. 205.
Constitution of Prothrombin. A. J. Quick.—p. 212.
Effect of Epinephrine on Frog Renal Hemodynamics in Intact Animal. R. P. Forster.—p. 221.
Blood Pressure Responses of Dogs to Vitamin A and Vitamin D₂. L. N. Katz, S. Rodbard and J. Meyer.—p. 226.
Effects of Anesthetic Dosage of Pentobarbital Sodium on Renal Function and Blood Pressure in Dogs. A. C. Corcoran and I. H. Page.—p. 234.
Effect of Vitamin A on Some Renal Functions of Dog. R. J. Bing.—p. 240.
Effect of Atropine and Quinidine Sulfate on Atrophy and Fibrillation in Denervated Skeletal Muscle. D. Y. Solandt, D. B. DeLury and J. Hunter.—p. 247.
Effect of Temperature of Blood on Heart Rate. E. K. Landsteiner and M. Hayes.—p. 256.
Effect of Administration of Estrogen on Mechanism of Ascorbic Acid Excretion in Dog. E. E. Selkurt, L. J. Talbot and C. R. Houck.—p. 260.

Annals of Allergy, Minneapolis

1:91-184 (Sept.-Oct.) 1943

- Allergic Findings in Epileptic Patients and Ancestors. R. H. Spangler.—p. 91.
Temporomandibular Arthropathy in Serum Sickness. P. L. Turner and T. W. Clarke.—p. 115.
Brief Critical Review of Fundamental Knowledge Concerning the Allergic Diseases. A. F. Coca.—p. 120.
*Dermatitis Venenata: Report on Allergy Clinics in Fourth Service Command. S. W. French and L. J. Halpin.—p. 131.
Deallergization versus Hyposensitization. E. Urbach and P. M. Gottlieb.—p. 139.
Chemistry of Ragweed Pollen Extract: III. Relationship of Amount of Nitrogen Precipitated by Heat Coagulation with Various Protein Precipitants in Saline Ragweed Extract. E. A. Brown and N. Benotti.—p. 150.
Effect of Beta-Hypophamine and Suprarenal Cortex Extracts on Prevention of Histamine Shock in Guinea Pig: Preliminary Report. F. W. Wittich.—p. 154.

Dermatitis Venenata.—French and Halpin report results of treatment of 2,544 patients with poison ivy dermatitis observed during the summer of 1942 in the Fourth Service Command. A 5 per cent alcoholic extract of poison ivy was prepared, and thirty-two stations were furnished an adequate supply. Dermatitis venenata was most troublesome during June and July. At one training center it was the established diagnosis in 15 per cent of all dispensary patients seen during this two month period. Dilution of the concentrated extract just prior to each injection furnished a 1:10 solution. Daily hypodermic administration of gradually increasing amounts was the usual routine. In most instances a dosage of from 0.4 to 0.5 cc. of the 1:10 dilution was reached by the fourth day of therapy. Rarely was

it necessary to continue the administration longer than four or five days. The majority of the patients gave a history of having had previous dermatitis on exposure to poison ivy. Thus patch testing was not a prerequisite to the therapy. Patch testing was done in instances in which there was doubt as to the diagnosis. Of the total number of 2,544 patients 1,748 were given treatment at their dispensary. These patients remained on full duty. The 754 patients who were admitted to the hospital were unable to remain on a full duty status. The average hospital stay was 8.7 days. A comparison of therapeutic methods was made on 50 patients with lesions of near equal severity. Alternate cases were treated with alcoholic extract injections or local applications. In the group receiving alcoholic extract there was an average of 8.4 hospital days per patient. The group in which local applications of lotions and creams were used recorded an average stay of 11.3 days per patient. Of the 1,851 patients treated with alcoholic extract of poison ivy leaves 86.4 per cent received satisfactory benefit, 68 per cent being classified as good and 18.4 per cent as fair results. In the 179 patients (9.7 per cent) in whom the results were poor the lesions responded very slightly. No improvement was obtained in 33 patients (1.8 per cent) and an increase in severity was observed in 38 patients (2.1 per cent). With the exception of soreness and swelling at the site of some of the injections no reactions were observed.

Archives of Pathology, Chicago

36:437-538 (Nov.) 1943

- Nerve Tumors of Female Genitals and Pelvis. R. Mejer.—p. 437.
Bronchiolar Lymphoid Hyperplasia as Cause of Emphysema: Report of Case. W. W. Brandes, R. A. Cook and M. P. Osborne.—p. 465.
Experimental Atherosclerosis in Chick. D. V. Danber and L. N. Katz.—p. 473.
Studies of Normal and Abnormal Mitotic Activity: III. Rate and Periodicity of Mitotic Activity in Regenerating Epidermis of Healing Wounds in Rabbits. C. M. Blumenfeld.—p. 493.
Influence of Endocrine Glands on Growth and Aging of Skeleton. M. Silberberg and Ruth Silberberg.—p. 512.

Archives of Surgery, Chicago

47:419-516 (Nov.) 1943

- Histomechanical Analysis of Nerve Reunion in Rat After Tubular Splicing. P. Weiss and A. C. Taylor.—p. 419.
Evaluation and Treatment of Factors Involved in Postlobectomy Collapse of the Lung. J. T. Chesterman.—p. 448.
Roentgenologic Demonstration of Spinal Metastases from Leiomyosarcoma of the Uterus. L. L. Robbins.—p. 463.
Germicidal Activity of Alcohol, Hydrochloric Acid and Aluminum Potassium Sulfate: Their Effect on Cutaneous Flora. Esther Meyer and E. E. Vicher.—p. 468.
Primary Tuberculosis of Spleen: Report of Case. H. D. Coffey and S. Lipton.—p. 478.
Progress in Orthopedic Surgery for 1942: Review Prepared by an Editorial Board of American Academy of Orthopaedic Surgeons; VIII. Amputations, Apparatus and Technic. J. W. White.—p. 483.

Germicidal Activity of Alcohol, Hydrochloric Acid and Aluminum Potassium Sulfate.—Meyer and Vicher evaluated the effect of a 0.5 per cent solution of hydrochloric acid on the bacterial flora of the hands and arms and compared it with the effect of a solution containing 70 per cent of alcohol by volume and that of a 10 per cent solution of aluminum and potassium sulfate. Alcohol in a concentration of 70 per cent by volume was found to be an efficient germicidal agent for the bacterial flora of the skin. A 0.5 per cent solution of hydrochloric acid was found to be highly efficient also but not entirely comparable to the alcohol. Aluminum and potassium sulfate in 10 per cent aqueous solution evidently hardens the skin to such an extent that the organisms are imprisoned but not killed. They may be released after the softening of the skin which occurs when rubber gloves are worn and then removed in the subsequent scrubbing. The authors believe that either alcohol 70 per cent by volume or hydrochloric acid 0.5 per cent is sufficiently efficient to use in the presurgical preparation of the surgeon's hands and that a 0.5 per cent solution of hydrochloric acid could safely be used so as to conserve the supply of alcohol for more essential purposes. They also believe that a 0.5 per cent solution of hydrochloric acid has a true germicidal action on the bacterial flora of the skin.

Bulletin New York Academy of Medicine, New York

19:749-812 (Nov.) 1943

- Nutrition Under Wartime Conditions: Harvey Lecture, May 20, 1943. V. P. Sydenstricker.—p. 749.
Andreas Vesalius, Professor at Medical School of Padua. A. Castiglioni.—p. 766.
Intermediary Metabolism in Diabetes Mellitus: Harvey Lecture, Jan. 15, 1942. W. C. Stadie.—p. 778.

Canadian Medical Association Journal, Montreal

49:251-348 (Oct.) 1943

- *Use of Isinglass as Blood Substitute in Hemorrhage and Shock. N. B. Taylor and Margaret S. Moorhouse, with technical assistance of A. J. Stonyer.—p. 251.
*Clinical Use of Isinglass. H. E. Pugsley and R. F. Farquharson.—p. 262.
Pathogenic Correlations Between Periarthritis Nodosa, Renal Hypertension and Rheumatic Lesions. H. Selye and E. Irene Pentz.—p. 264.
Possible Transfer of Tropical Disease Due to War Conditions. T. W. M. Cameron.—p. 273.
Infectivity of Fluorescent Hairs in Scalp Ringworm. D. E. H. Cleveland.—p. 280.
Bright's Disease—A Clinical and Pathologic Study. L. J. Adams and S. R. Townsend.—p. 282.
Bronchopulmonary Suppurations Treated with Instilled Sulfathiazole Solution. V. Latraverse.—p. 290.
Riboflavin and Vitamin A in Relation to "Eye Strain." L. B. Pett.—p. 293.
Three Years of Neuropsychiatry in Canadian Army (Overseas). F. H. van Nostrand.—p. 295.
Otitic and Sinus Barotrauma. J. G. MacKenzie.—p. 301.
Bronchoscopy in Management of Massive Pulmonary Collapse. G. A. Henry.—p. 305.
Oropharyngeal Ulceration with Conjunctivitis and Skin Lesions. S. J. Shane.—p. 309.
Medical Branch of Navy in Fourth Year of War. A. McCallum.—p. 311.
Evacuation from Greece. W. M. Tait.—p. 314.

Isinglass as Blood Substitute in Hemorrhage and Shock.—Taylor and his associates think that in the event of heavy casualties the supply of blood serum may be insufficient and that a blood substitute should be kept in reserve. They reported experimental studies with isinglass two years ago and now describe additional investigations with this collagen, which they produce from swim bladders of fish. They demonstrated in experiments on dogs that transfusion either with whole blood or with a solution of isinglass was relatively ineffective in the treatment of shock caused by muscle damage. The difference between the results of transfusion in acute hemorrhage and in shock is offered as evidence against the theory of local fluid loss being a primary factor in the development of shock due to muscle injury. The authors describe tests for pyrogenic and antigenic activity of isinglass. The isinglass as now prepared has a relatively mild pyrogenic action. The temperature rise is well within the limits specified in the pyrogen test of the United States Department of Public Health. Isinglass is free from antigenic action. No abnormalities have been observed in the livers and kidneys of animals which have received repeated injections of isinglass intravenously over a period of weeks. The regeneration of plasma protein after depletion caused by acute hemorrhage does not appear to be interfered with by the transfusion of isinglass solution. There is some evidence that the injected protein is utilized for building body tissue and possibly in the manufacture of plasma protein.

Clinical Use of Isinglass.—Pugsley and Farquharson administered isinglass prepared by Taylor to 61 patients at the Toronto General Hospital. They used purified, powdered isinglass in concentration of 4 to 7 per cent dissolved in isotonic solution of sodium chloride. A total of 58 intravenous administrations was given to 51 patients chiefly for the purpose of detecting pyrogenic or other toxic effects; the remaining 10 patients were given isinglass solution for the treatment of shock or hemorrhage. A febrile reaction followed in 8 instances. In no case was the fever sustained longer than a few hours. A definite chill marked the onset in two febrile reactions. The remaining patients complained of a chilly sensation. Other associated symptoms in these patients were malaise, headache and nausea. In the remaining 50 infusions of isinglass solution no unfavorable symptoms followed. Ten patients suffering from the effects of shock or severe circulatory collapse were

treated by the intravenous administration of isinglass solution. All patients responded favorably; there was no evidence that the isinglass had given rise to toxic manifestations. The dose of isinglass infused varied from 200 cc. in the case of an infant to a total of 8,800 cc during the course of three days to a patient suffering from severe burn shock.

Hawaii Medical Journal, Honolulu

2:293-340 (July-Aug.) 1943

- Dengue Fever I J. R. Enright—p. 293.
Id.: II. Review and Report of Three Cases F. D. Nance—p. 295
Rubonic Plague on Island of Hawaii C. L. Carter—p. 296
Glomus Tumor of Wrist Clinicopathologic Study of Case R. B. Cloward and I. L. Tilden—p. 299
Investigation of Tattooing in Honolulu B. Witlin—p. 302

Journal of Clinical Endocrinology, Springfield, Ill.

3:529-572 (Oct.) 1943

- Experience with a Quantitative Test for Normal or Decreased Amounts of Follicle Stimulating Hormone in Urine in Endocrinologic Diagnosis H. F. Klinefelter Jr., I. Albright and Grace C. Griswold—p. 529
Use of Desiccated Blood Pellets in Biologic Assay of Blood Estrogens. B. J. Meyer and E. L. Sevringhaus—p. 545
Two and Six Hour Pregnancy Test Preliminary Report H. S. Kupperman, R. B. Greenblatt and C. R. Nohrck—p. 548
Sublingual Use of Testosterone in 7 Cases of Hypogonadism: Report of 3 Congenital Eunuchoids Occurring in One Family L. M. Hurxthal—p. 551.
Thecoma and Hyperthecosis of Ovary I. Frenle—p. 557.

Two and Six Hour Pregnancy Tests.—Kupperman and his associates devised a two and a six hour pregnancy test which employs rats of almost any age or weight. The two hour test is based on the hyperemic effect of urinary gonadotropins on the ovary and ovarian capsule noted two hours after intraperitoneal injection of 1.5 cc. of urine in divided doses of 0.75 cc. each. The rats may be of any age (21 to 55 days) or weight (30 to 100 Gm.) provided vaginal introitus or corpus luteum formation has not occurred. If the six hour test is performed on immature rats the end reaction is the hyperemic effect of the urinary gonadotropin on the ovary and ovarian capsule. The diagnostic feature in the adult animal is the vascularizing effect of pregnancy urine on the corpora lutea of animals injected when in diestrus or metestrus. Of 33 specimens of urine from nonpregnant individuals there was no instance of a false positive reaction. Only 2 of 48 samples of pregnancy urine gave an indecisive reaction, but the urines from these patients yielded strongly positive reactions five days later. In performing the test 3 rats are sufficient, 2 for the two hour test and 1 for the six hour test. In instances of a negative test it is advisable to inject at least 2 more animals for confirmatory data.

Sublingual Use of Testosterone.—Hurxthal deals with the results of administration of testosterone in propylene glycol-alcohol sublingually in 6 cases of hypogonadism and 1 case of hypopituitarism. In the case of hypopituitarism, testosterone in propylene glycol-alcohol solution also was rubbed into the skin of one axilla and one side of the pubic area, demonstrating its local effect. In 4 cases testosterone was given for the first time. The other patients, in whom maintenance doses of testosterone by pellet implantation, injection or oral administration had been established, were given sublingual testosterone for a comparison of its maintaining effect. The preparation was administered in sublingual doses of 1 or 2 drops, which the patient was instructed to hold there for two to three minutes without swallowing. When a larger amount was administered the patient was instructed to take portions of it at convenient times throughout the day. Three of the cases of eunuchoidism reviewed here occurred in one family. The effectiveness of testosterone in propylene glycol-alcohol administered sublingually was demonstrated. It appears that in untreated eunuchoidism two or three times as much testosterone is needed sublingually as by pellet implantation. For maintenance purposes the sublingual administration of testosterone in propylene glycol-alcohol in eunuchoid patients compares favorably with intramuscular injection of testosterone propionate in oil in some cases but not in others.

Journal of Clinical Investigation, Boston

22:763-894 (Nov.) 1943

- Studies on Plasma Proteins. V. Effect of Concentrated Solutions of Human and Bovine Serum Albumin on Blood Volume After Acute Blood Loss in Man J. T. Heyl, J. G. Gibson 2d and C. A. Janeway, with technical assistance of Anne Shwachman and L. Wojcik—p. 763.
*Variations of Plasma Vitamin A Level After Administration of Large Doses of Vitamin A in Liver Disease H. Popper, F. Steigmann and S. Zevin—p. 775
*Calcium and Phosphorus Metabolism in Rheumatoid Arthritis and Degenerative Joint Disease Marian W. Ropes, Elsie C. Rossmeisl and W. Bauer—p. 785.
New Modified Protamine Zinc Insulin: Comparison with Histone Zinc Insulin, Clear and Standard Protamine Zinc Insulins C. M. MacBryde and H. K. Roberts—p. 791.
*Excretion of Gonadotropic Hormone by Prepubertal and Adolescent Girls H. R. Catchpole and W. W. Greulich—p. 799
Lung Volume and Its Subdivisions in Upright and Recumbent Positions in Patients with Congestive Failure. Pulmonary Factors in Genesis of Orthopnea M. D. Altschule, N. Zamcheck and A. Iglauei—p. 805
Clinical Studies on Incoordination of Circulation as Determined by Response to Arising I. Starr—p. 813
Pancreatic Function and Disease in Early Life. I. Pancreatic Enzyme Activity and the Celiac Syndrome S. Farber, II. Shwachman and Charlotte L. Maddock—p. 827
*Evidence That Body Irritations or Emotions Retard Gastric Evacuation, Not by Producing Pylorospasm but by Depressing Gastric Motility. J. P. Quigley, H. J. Bavor, M. R. Read and B. L. Brofman—p. 839
Traumatic Shock: VI. Effect of Hemorrhagic Shock on the Concentration of Renin and Hypertensinogen in Plasma in Unanesthetized Dogs L. Dexter, H. A. Frank, Florence W. Haynes and M. D. Altschule—p. 847.
Experimental Studies on Headache: Pharmacodynamics of Urine Excreted During Migraine Headache and Its Relation to 17 Ketosteroid Content. Clara Torda and H. G. Wolff—p. 853
Physiologic Intravascular Hemolysis of Exercise Hemoglobinemia and Hemoglobinuria Following Cross Country Runs D. R. Gilligan, M. D. Altschule and E. M. Katersky—p. 859.
Analgetic Effects of Low Concentrations of Nitrous Oxide Compared in Man with Morphine Sulfate W. P. Chapman, Julia G. Arrowood and H. K. Beecher—p. 871.
Relation of Gastric Function to Nausea in Man. S. Wolf—p. 877

Plasma Vitamin A Level After Administration of This Vitamin in Liver Disease.—Popper and his collaborators studied the influence of various liver diseases on vitamin A tolerance curves. Tolerance tests were made on 108 patients; 71 of these had disease of the liver or biliary tract, the remaining 37 were used for comparison. It was found that in patients with liver disease the tolerance curve is much flatter than in normal persons; it parallels the degree of liver damage. It is less flattened in arrested cirrhosis without jaundice and in biliary obstruction without hepatitis than in toxic hepatitis or cirrhosis with jaundice or in biliary obstruction with secondary hepatitis. With clinical improvement the tolerance curve and the low fasting plasma vitamin A level of patients with liver damage return toward normal. By comparison of the tolerance curves with a vitamin A content of liver biopsy specimens from the same patients, by comparison of the tolerance curves before and after saturating the liver with large amounts of vitamin A and by study of the tolerance curves in conditions known to be associated with disturbed intestinal absorption, evidence was obtained that the tolerance curves are not related to the liver saturation of vitamin A but rather to the efficiency of vitamin A absorption from the intestine. The disturbed intestinal absorption of vitamin A in liver disease is not primarily related to the degree of jaundice but rather to the degree of liver damage. The authors have been unable to correct the absorption damage by the administration of various bile acid preparations. Nevertheless the possibility cannot be excluded that in liver damage the absence of some particular bile acid from the intestine is the cause of the faulty absorption of vitamin A.

Calcium and Phosphorus Metabolism in Rheumatoid Arthritis.—The occurrence of decalcification in patients with rheumatoid arthritis and of marginal lippling or osteophyte formation in persons with degenerative joint disease suggested to Ropes and her collaborators that an alteration of calcium and phosphorus metabolism might be a primary feature of these diseases. The authors studied the calcium, phosphorus and nitrogen metabolism of 9 patients with rheumatoid arthritis and 3 patients with degenerative joint disease. The results revealed that the calcium and phosphorus metabolism grossly

in patients with rheumatoid arthritis and degenerative joint disease. Detailed analysis indicated a slight tendency toward an increased rate of calcium metabolism and increased calcium excretion in patients with rheumatoid arthritis and a decreased calcium excretion in individuals with degenerative joint disease. The magnitude of the increased loss and retention, respectively, was small and may not be of importance. However, the variations from normal cannot be explained by any of the factors known to influence calcium metabolism and, although slight, may be sufficiently great to be of significance over a long period of time.

Excretion of Gonadotropic Hormone by Prepuberal and Adolescent Girls.—Catchpole and Greulich studied 4 girls at a correctional institution and 8 girls representing ambulatory cases from a tuberculosis sanatorium. Studies on 4 of the latter were repeated after a one year lapse of time. An attempt was made to obtain daily twenty-four hour urine specimens from all subjects for a period of one month at least. The subjects ranged in age from 4 years and 4 months to 14 years and 6 months. Only 1 had menstruated before the assays were made. Several of the subjects experienced first menses from one to several months after the determinations were performed. In the urine of the youngest girls either no hormone or only small quantities could be detected. In preadolescent girls hormone appeared more frequently and in larger amounts. With increasing quantities, fluctuations in day by day amounts became evident, but these did not appear to be systematic or cyclic. The pattern of gonadotropic hormone output appeared to be related more closely to developmental status than to chronological age of the subjects. Hormonal activity in girls was on generally lower level than that recorded for the fully developed adult menstrual cycle. It is suggested that this activity is to be correlated with a preovulatory phase of sexual development.

Retardation of Gastric Evacuation.—The impression is prevalent that pylorospasm results from emotions or through viscerovisceral or somatovisceral reflexes initiated by irritation of any portion of the body. It is also believed that the delay in gastric evacuation which results from such irritation is largely or entirely due to pylorospasm. Quigley and his collaborators show that much of the evidence on which these concepts rest may be questioned. They have irritated various parts of the body in unanesthetized dogs and have attempted to determine the effects not only on the pyloric sphincter but simultaneously on the motility of the pyloric antrum and duodenal bulb and on the gastric evacuation process. A series of 9 dogs were provided by the method of Meschan and Quigley with permanent cannulas giving access to the gastric and duodenal lumens. These animals were trained to lie in comfortable hammocks and to cooperate with the experimental procedures. The pyloric sphincter region (antrum, sphincter and bulb) tended to behave as a unit; in action the sphincter was similar, not contrary, to the antrum. Emotions and noxious stimuli did not produce pylorospasm but tended to inhibit the entire sphincter region; they retarded gastric evacuation. This retardation resulted from decreased antral peristalsis. The delayed evacuation was not due to pylorospasm; it developed in spite of the pyloric relaxation. The claim that pylorospasm is readily produced by emotional states or noxious bodily stimuli receives little support from this experimental study or from a critical consideration of the clinical evidence.

Journal-Lancet, Minneapolis

63:337-382 (Nov.) 1943

- Introduction to Symposium on Vitamins. A. Keys.—p. 337.
Newer Members of Vitamin B Complex. C. A. Elvehjem.—p. 339.
Vitamin D. Genevieve Stearns.—p. 344.
Ascorbic Acid Intake and Appearance of Vitamin C Deficiency. F. W. Fox.—p. 349.
Medical Aspects of Vitamin K. H. Dam.—p. 353.
Vitamins and Physical Performance. A. F. Henschel.—p. 355.
Climate and Vitamin Requirements. H. L. Taylor.—p. 358.
Laboratory Methods of Evaluating Vitamin Nutritional Status. O. Mickelsen.—p. 360.
Clinical Diagnosis of Deficiencies of Thiamine, Riboflavin and Niacin. L. E. Holt Jr. and V. A. Najjar.—p. 366.
Growth of Scientific Knowledge on Vitamin Needs of Man. A. J. Carlson.—p. 371.

Kansas Medical Society Journal, Topeka

44:325-360 (Oct.) 1943

- Fundamentals of Psychiatry: XI. Mental Dynamisms. W. C. Menninger.—p. 325.
Bacillary Dysentery. J. B. Nanninga.—p. 331.
Migraine: Review of Current Opinion on Its Pathology and Treatment. F. A. Carmichael.—p. 333.

44:361-396 (Nov.) 1943

- Fundamentals of Psychiatry: XII. Psychiatric Treatment. W. C. Menninger.—p. 361.
*Peptic Ulcer, an Endocrine Disease. J. A. Crabb.—p. 368.

Peptic Ulcer, an Endocrine Disease.—Crabb treated patients with peptic ulcer by administering 1 cc. of parathyroid extract every third day for three doses, then of 10 minims (0.6 cc.) every five to seven days for from six to twelve doses. He also used a palliative such as a bismuth and a paregoric mixture or an alkaline powder to be taken twenty or thirty minutes before the expected pain for the purpose of neutralizing the hydrochloric acid and to coat over and temporarily protect the ulcer from the eroding gastric juice. He thinks that it is not advisable to give alkalis immediately after meals at any time. They render pepsin inert and interfere or prevent the proper digestion of proteins. The diet was restricted to liquids or nourishing nonirritating soft foods for a few days and later was gradually increased in variety and quantity. Based on his experience in the use of parathyroid in the treatment of peptic ulcer in a large number of cases continuously during the last sixteen years, it is the author's opinion that peptic ulcer is an endocrine disease caused by a lack in the system of the parathyroid hormone. The treatment is therefore replacement therapy.

Oklahoma State Medical Assn. Jour., Oklahoma City

36:415-460 (Oct.) 1943

- Radium Therapy in Treatment of Cancer of Skin. L. M. Piatt.—p. 415.
Role of Medical Short Wave Therapy in Otolaryngology. E. H. Coachman.—p. 417.
Comparative Symptoms in Peptic Ulcer and Cholecystitis in 200 Cases. A. B. Carney.—p. 420.
Sanitation in Wartime. H. J. Darcey.—p. 423.
Modern Aids in Treatment of Appendicitis. F. M. Lingenfelter, J. W. Cavanaugh and H. Richey.—p. 425.
How Firm the Foundation, How Frail the Superstructure. L. J. Moorman.—p. 431.

Southern Medical Journal, Birmingham, Ala.

36:665-708 (Oct.) 1943

- Facial Fractures as Seen in Naval Service. T. H. Lipscomb.—p. 665.
Osteodystrophia Fibrosa Cystica and Juvenile Hyperthyroidism. J. E. Jacobs.—p. 668.
Primary Bronchial Actinomycosis. G. McHardy and D. C. Browne.—p. 674.
Congenital Sacrococcygeal Tumors: Case Report of a Teratoma. M. P. Neal and J. B. Carlisle.—p. 677.
Stilbestrol in Treatment of Extrauterine Placenta. A. P. Hudgins.—p. 678.
Carcinoma of Prostate. C. L. Prince and S. A. Vest.—p. 680.
Cancer of Left Colon and Rectum. R. L. Murdoch.—p. 685.
Gross Anatomy of Superior Hypogastric Plexus. R. H. Hoge and Louise Jones.—p. 691.
Nephrosis Associated with Early Active Syphilis. A. Klein and W. B. Porter.—p. 694.
Acute Visual Impairment During Tryparsamide Therapy. W. B. Potter.—p. 697.
Recognition and Radium Treatment of Nasopharyngeal Lymphoid Tissue. G. E. Fisher.—p. 702.

Southwestern Medicine, Phoenix, Ariz.

27:237-266 (Oct.) 1943

- Medical and Surgical Aspects of Commonly Used Sulfonamides. A. P. Kimball.—p. 241.
Practical Surgery of Ovary. G. Hensinkveld.—p. 246.
Red Blood Cells of the Plasma Bank. M. Semoff.—p. 248.

Tennessee State Medical Assn. Journal, Nashville

36:373-412 (Oct.) 1943

- Convulsions Under Ether Anesthesia. M. B. Davis.—p. 373.
Multiple Cost of Social Security. C. O. Pauley.—p. 382.

36:413-452 (Nov.) 1943

- Local Treatment of Burns. R. B. Chrisman Jr.—p. 413.
Bacillary Dysentery: Résumé of Disease and Its Modern Treatment. E. L. Turner.—p. 424.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Brain, London

66:163-236 (Sept.) 1943

- Arteriovenous Aneurysm of Midbrain and Retina, Facial Nevi and Mental Changes. R. Wyburn-Mason.—p. 163.
Vascular Factor in Intracranial Pressure and Maintenance of Cerebrospinal Fluid Circulation. J. E. A. O'Connell.—p. 204.
Marchi Reaction: Its Use on Frozen Sections and Its Time Limit. P. Glees.—p. 229.

British J. Children's Diseases, Dorking, England

40:63-92 (July-Sept.) 1943

- *Use of Sulfonamides in Measles. R. Swyer.—p. 63.
Actinotherapy in Children. Eva Morton.—p. 68.

Use of Sulfonamides in Measles.—Swyer studied 1,193 cases of measles with a view of determining the effects of sulfonamides. The drugs were given to 324 patients for a short period immediately after admission; the remaining 869 patients did not receive sulfonamides unless complications arose. An additional 64 cases of bronchopneumonia and 29 of otitis media which occurred in an earlier epidemic were also examined as controls in the assessment of the value of this chemotherapy in treatment as opposed to prophylaxis of complications. The results were as follows: The complication rate was reduced from 13.7 to 11.4 per cent. The average hospitalization of uncomplicated cases was reduced from 12.2 to 10.8 days, but that of all complicated cases was unaltered. The mortality of bronchopneumonia was about halved. Results of treatment of otitis media were inconclusive, but the average length of hospitalization was reduced from thirty-nine days in controls to twenty-eight days in sulfonamide treated patients. Toxic manifestations were rare and mild. The author concludes that a short prophylactic course is not worth while. Having regard to the measure of therapeutic control possible for established complications (bronchopneumonia and otitis media) it is questionable whether routine sulfonamide prophylaxis with its potential risks is desirable.

British Medical Journal, London

2:535-566 (Oct. 30) 1943

- Transplantation of Ureters into Large Bowel. G. G. Turner.—p. 535.
Ocular Manifestations of Neuroses Commonly Found Among Soldiers. I. C. Michaelson.—p. 538.
Human Fibrin as Dressing for Burns. R. G. MacFarlane.—p. 541.
Outbreak of Sandfly Fever in Two General Hospitals in Middle East. E. R. Cullinan and S. R. F. Whittaker.—p. 543.
Sandfly Fever and Rheumatic Series. R. L. Ferguson.—p. 545.

2:567-598 (Nov. 6) 1943

- *Treatment of Gunshot Fractures of Limbs. S. S. Yudin.—p. 567.
Some Therapeutic Fallacies. J. W. Linnell and W. A. R. Thomson.—p. 572.
Observations on Acid Hematin Method for Estimation of Hemoglobin. C. A. Ashford.—p. 575.
Local Application of Sulfanilamide Powder in Radiotherapy. A. A. Charteris.—p. 577.
Renal Function in Myxedema. G. E. Beaumont and J. D. Robertson.—p. 578.

Treatment of Gunshot Fractures of Limbs.—Yudin presents experiences gained in eighteen months of war. The methods used are based on three therapeutic factors: wide surgical excision of the wound, adequate local and general use of sulfonamides and prolonged fixation in plaster. He describes the aims and technic of operations for gunshot fracture of the femur at various times after occurrence of the injury and with varied degrees of infection. When operation is undertaken within a short time the procedure is confined to the removal of foreign material and damaged or devitalized tissue. In such cases additional drainage is seldom required, but the wounds are not sutured. In treatment undertaken at a later period the method of choice is wide excision of infected and necrotic tissue and great care in mechanical cleansing, followed by free drainage. Adequate excision of muscle, so as to produce a funnel shaped aperture for drainage, is of great importance. The

excision should not be excessively wide. The removal of muscles with arteries traversing them is dangerous, and in consequence the author has advocated the lateral approach through the vastus lateralis. In 350 cases of such fractures with gross sepsis in which he operated he has not had 1 single case of nonunion of the fracture. In addition, owing to the use of incision through the vastus lateralis and the technic of suturing the skin to the fascia lata he has not seen defective movement of the limb which can be attributed to postoperative defect in muscles. The first task in the treatment of a wounded man is to prevent the loss of life and limb by infection. The procedures described are often tedious and time consuming, and it has been said that such treatment cannot be used when the number of patients is large. However, they are irreplaceable by any other method of therapy, and by their means 95 per cent of patients with these injuries have their lives and limbs saved. Other methods and splinting, though useful for transport, are unsuitable for immobilization treatment over any length of time and cannot replace the use of plaster. Inadequate excision and temporary splintings could be justified only under conditions of great stress to enable the patient to be transported from the front line to the hospital.

Journal Obst. & Gynaec. of Brit. Empire, Manchester

50:317-392 (Oct.) 1943

- Schistosomiasis (Bilharziasis) of the Female Genital Tract and Neighboring Tissues. B. Gilbert.—p. 317.
*Premature Rupture of Membranes: Effect on Labor At or Near Term; Review of 320 Cases and Results. D. S. Greig.—p. 337.
Vesicovaginal Fistula: Review of 65 Locally Inoperable Cases, Treated by Transplantation of Both Ureters into Pelvic Colon. H. E. Murray and H. Ahmed.—p. 347.
Breech Presentation in Elderly Primipara. D. C. Racker.—p. 352.
Pregnancy and Labor in Case of Intrapelvic Protrusion of Acetabulum. W. S. Campbell.—p. 359.
Case of Pseudohermaphroditism. E. Solomons.—p. 363.
Torsion of Pregnant Uterus. W. Jonas.—p. 366.
Chromophobe Adenoma of Hypophysis Cerebri. G. G. Lennon.—p. 369.

Premature Rupture of Membranes.—Greig reports 320 cases of premature rupture of membranes occurring in a consecutive series of 2,149 deliveries conducted in a wartime emergency maternity hospital in the years 1940 to 1942. Premature rupture of membranes is defined as having taken place when the rupture of the membranes precedes labor pains. In order to have two fairly comparable series the author eliminated 159 cases with highly abnormal conditions such as antepartum hemorrhage, surgical inductions and fetal deformities. There remained for comparison (1) a series of 310 cases of premature rupture of the membranes and (2) a series of 1,680 cases of orthodox labor. Only cases of over thirty-six weeks' gestation are considered. There is a definite increase in the incidence of premature rupture of membranes in cases of abnormal presentations such as occipitoposterior, breech and twin presentations. Parity and toxemia are not factors in producing premature rupture of membranes. On the average the length of labor is not increased. In 60 per cent of cases the premature rupture of membranes and the onset of labor are clinically simultaneous. Labor is appreciably shorter than normal in this class of case. When there is delay in the onset of labor after loss of liquor amnii, labor is appreciably longer and there is a noteworthy increase in the incidence of prolonged labor over thirty hours. Here probably is the justification for the old concept of "dry labor." Intervention can be kept at least to normal limits in cases of premature rupture of membranes. Good results can be obtained by careful management.

Journal of Physiology, Cambridge

102:127-258 (Sept. 30) 1943. Partial Index

- Capillary Permeability in Traumatic Shock. D. Engel and E. Forrai.—p. 127.
Effect of Exercise on Chloride Excretion in Man During Water Diuresis and During Tea Diuresis. M. Grace Eggleston.—p. 140.
Muscular Activity and Choline Esterase. Phyllis G. Croft and D. Richter.—p. 155.
Rate of Regeneration of Peripheral Nerves in Man. H. J. Seddon, P. B. Medawar and H. Smith.—p. 191.
Influence of Posture on Pulmonary Blood Volume and Alveolar Gas Tensions. I. F. S. Mackay.—p. 228.

Prensa Médica Argentina, Buenos Aires**30:1915-1958 (Oct. 6) 1943. Partial Index**

Gastric and Duodenal Reactions in Chronic Appendicitis. C. Bonarino Udaondo.—p. 1922.

*Infantile Paralysis: Study of a Recent Epidemic in Argentina. D. Vivoli and N. S. Loizaga.—p. 1940.

Infantile Paralysis.—An epidemic of an infectious disease presenting clinical features of poliomyelitis occurred in Argentina during the period 1942-1943. The incidence was higher in infancy and childhood and the clinical manifestations were essentially those of an acute infectious illness followed by partial or complete muscular paralysis affecting predominantly the limbs. Forms of spinal, bulbar and encephalitic poliomyelitis were clinically recognized. A number of patients died, and in the microscopic examination Vivoli and Loizaga found spherical or falciform corpuscles, sized 2.5 to 4.5 microns, located in the extracellular spaces and in the cytoplasm of macrophagic cells of the spinal cord, medulla, oblongata, intumescence, brain, liver, intestine and lymph nodes. Fragments of the spinal cord of 2 patients injected intraperitoneally or by mouth into rabbits and guinea pigs caused the death of these animals in a few days. Some of the animals developed paralyzes of the limbs. Pathologic examination showed in the organs of the inoculated animals the presence of the same corpuscles found in the patients. By their morphologic characteristics these small corpuscles were considered to be protozoan organisms, most likely toxoplasma. Attempts to cultivate the micro-organisms failed. According to Vivoli and Loizaga it is impossible to ascertain whether the epidemic was one of poliomyelitis, although the clinical symptoms in all cases were indistinguishable from those of poliomyelitis observed in previous outbreaks in Argentina.

Revista Chilena de Pediatría, Santiago**14:549-628 (Aug.) 1943. Partial Index**

*Meningitis Due to Pfeiffer Bacillus. J. Schwarzenberg L. and B. Montero Sierra.—p. 549.

Sulfathiazole in Therapy of Osteomyelitis: Case. W. Galasso V. and S. Finkelstein R.—p. 597.

Meningitis Due to Pfeiffer Bacillus.—Schwarzenberg and Montero Sierra report 6 cases of acute purulent meningitis due to *Haemophilus influenzae*. The meningeal symptoms appeared in the course of inflammation of the respiratory tract. The therapy consisted of administration of sulfonamide preparations in daily doses of 0.30 Gm. of the drug per kilogram of weight and of blood transfusion. It failed in all cases but 1. *Haemophilus influenzae* was identified in the cerebrospinal fluid obtained by ventricular puncture in the course of sulfonamide therapy and shortly before death. It was identified also in the cerebrospinal fluid obtained by lumbar puncture in some cases. Necropsy revealed a diffuse fibrinous purulent leptomeningitis, blockage of ventricles, encephalitis, cerebral abscesses and in some cases purulent pleurisy and septicemia.

Münchener medizinische Wochenschrift, Munich**89:637-658 (July 17) 1942. Partial Index**

*Indications for Treatment of Suppurative Inflammation of Knee Joint in Wartime and for Amputation. H. Westhues and H. Rüd.—p. 637. Method of Treatment of Syphilis by Dietetics and Cold Water. W. Richter.—p. 641.

*Changes in Stored Placental Blood. H. D. Ellenbeck and J. Carlblom.—p. 644.

Question of Myalgia in Cardiac Muscles. H. Ahringsmann.—p. 646.

*Insulin Therapy of Carcinoma. G. Schulte and H. Schütz.—p. 648.

Hepatic Disturbances and Rheumatism. E. L. Luft.—p. 651.

New Type of Silver Nitrate Points (Nitretten) C. Fervers.—p. 651. Lichen Urticatus Produced by Noxious Insects. F. Hamburger.—p. 652.

Treatment of Suppurative Inflammation of Knee Joint.—Westhues and Rüd emphasize the importance of radical surgical intervention in cases of suppurative inflammation of knee joint. In wartime surgeons should make a rule that Låwen's method of frontal resection of the condyle or the even more radical method of resection of knee joint should be practiced. The latter method should be economically performed by chiseling off a narrow disk of bony cartilage from the condyle of the femur, including particularly the posterior parts of the condyle. Less radical intervention will not prevent stiffness of

the knee but will be associated with much more danger for the leg and the life of the wounded. Puncture should be strictly limited to early cases of blood extravasation or effusion. Radical incisions at the four edges of the joint at the same time and continuous irrigation immediately after the incisions were made may be practiced only in cases of pseudophlegmon in the presence of collateral edema associated with empyema of the knee joint, but irrigation should be discontinued if total empyema does not disappear within a very short time. The method of opening up the knee joint will provide escape of pus but requires an acute angled position of the knee which may be impossible, owing to additional wounds of the leg. Conservatism should be the rule with regard to indications for amputation. The problem of saving the leg is first and foremost a problem of adequate postoperative immobilization which will provide control of suppuration and will facilitate change of dressing. A gravitation abscess may make treatment more difficult but need not be considered as indication for amputation, whereas an erysipelatosus phlegmon should be. Blood transfusions, acid diet and exposure to air and sunlight may help to avoid amputation. Amputation may be indicated in cases in which the general condition has become worse in spite of local improvement and should be performed in the presence of local or general septic symptoms before the clinical picture of sepsis has been developed. Conservatism with regard to amputation does not entail an increase in the mortality rate.

Changes in Stored Placental Blood.—Ellenbeck and Carlblom state that stored blood of the umbilical cord undergoes certain changes and that its value compared to that of fresh blood is reduced. Its behavior has been the same as that of stored donor blood. For the first fourteen days changes in stored placental blood have been less definite than is reported in the literature with regard to stored donor blood. That applies to the disappearance of neutrophil leukocytes, to the behavior of the albumin-globulin quotient and to the increase of the potassium content of plasma.

Insulin Therapy of Carcinoma.—In the treatment of 25 patients with carcinoma, Schulte and Schütz employed Brüning's method, consisting of the administration of protamine zinc insulin combined with a low carbohydrate diet. Continuous blood sugar examinations were performed but proved of little value, since the blood sugar level did not reflect accurately the local or general effect of insulin on the organism afflicted with tumor. A high degree of tolerance to insulin similar to that in old persons with diabetes mellitus could not be demonstrated. Pronounced susceptibility to insulin of emaciated patients with carcinoma placed on a liquid-pulp diet corresponded to that of lean patients with diabetes mellitus on a low diet, as experienced by American authors. Euphoria has been the prominent characteristic of the effect of insulin therapy in carcinoma. Psychic ups and downs, however, have been observed, but these may be due to difference in the absorption rapidity of protamine zinc insulin. An objective direct effect on the tumor could not be demonstrated on roentgenologic examination, although an improvement of deglutition was manifest in cases of carcinoma of the esophagus which reacted to insulin. Complete failure of insulin was found in a case of carcinoma of the cardia in which no subjective or objective improvement could be demonstrated. The temporary analgesic effect of insulin resulted in almost complete disappearance of pain in a few cases and in a peculiar, somewhat dull pain in others; but pain became even worse when insulin therapy was discontinued. An analgesic effect was not manifest in some cases in which cancer was demonstrated on microscopic examination. Increase in appetite was noted in some patients with a resulting increase in weight of from 1 to 2 Kg., but considerable loss in weight was likewise associated with good appetite and large food intake. The peak of the insulin effect occurred within eight to ten days and was occasionally prolonged for two months. A true palliative effect cannot be attributed to insulin therapy of carcinoma. Roentgen therapy was practiced after insulin therapy, but tolerance to roentgen rays did not improve and a definite effect on the tumor could not be demonstrated. Insulin therapy may be only occasionally employed to alleviate pain and to improve a depressive mood in patients with carcinoma.

Book Notices

Traffic in Opium and Other Dangerous Drugs for the Year Ended December 31, 1942. Report by the Government of the United States of America. U. S. Treasury Department, Bureau of Narcotics. Cloth. Pp. 66, with 3 illustrations. Washington, D. C.: Government Printing Office, 1943.

This document, covering the calendar year 1942, constitutes the report of the government of the United States on the traffic in opium and other dangerous drugs for distribution through the Secretary of State to the nations signatory to the international drug conventions of 1912 and 1931. According to the report, reserve supplies of opium now stored in this country are ample to fill medical and scientific needs for several years. The number of nonmedical drug addicts in this country is estimated at no more than 1 in every 3,000 of the population, a reduction of at least 66 per cent in the past two decades. Vigilance must be exercised, however, to maintain this ratio of reduction, since war conditions frequently beget a relaxation of drug control, as has already occurred in Iran. In its analysis of the illicit traffic in narcotics, the Bureau of Narcotics records in this report that, along with Iran and Cuba, Mexico has now become the principal source of smuggled drugs seized in the illicit traffic throughout the United States. On the Mexican border, seizures of smoking opium were thirty times as large as in 1941, the major seizure during the year consisting of 27 pounds 3 ounces taken from a Mexican at Yuma, Ariz. Morphine, which formerly ranked next to heroin as a favorite drug of addiction, was extremely scarce. There were limited quantities of morphine sulfate available at extremely high prices, but morphine hydrochloride, with the exception of two seizures in Texas, was practically nonexistent on the illicit market. Heroin was obtainable in some sections of the country at very high prices but was often so highly adulterated as to be almost valueless so far as the maintenance of addiction was concerned. As a result of bootleg sources being greatly diminished there was an increased trend toward robberies and thefts from physicians' offices and drug stores. The adoption of measures to safeguard these supplies is urged by the Bureau of Narcotics. In states which permit the sale of paregoric without prescriptions, addicts purchase the drug in increasingly larger amounts and with accelerated frequency. By what might be designated a "cracking process," opium may be salvaged from paregoric, which the addict uses by hypodermic injection or orally. Compared with Canada, where the retail sale of paregoric is limited to prescriptions, the per capita consumption of this preparation in the United States is about fifteen times as high. The bureau recommends that the sale of paregoric be placed on a prescription basis. In the opinion of the bureau the most troublesome type of diversion of narcotic drugs from legitimate channels is that represented by the sale of morphine or of so-called morphine prescriptions by the relatively few unethical physicians who for financial gain descend to the level of and replace the drug pedler. Reference in detail is made to the case of one physician who issued 1,696 prescriptions between July 1, 1941 and Sept. 23, 1942 calling for a total of 37,602 $\frac{1}{4}$ grain morphine tablets. In addition, this physician purchased on official order forms 7,000 $\frac{1}{4}$ grain morphine tablets, making a total of 44,602 tablets dispensed or prescribed. This physician practiced in a small town with a population of 425. The total quantity of morphine seized during the year was 137 ounces, as compared with 96 ounces seized in 1941; of heroin, 879 ounces as compared with 922 ounces; of cocaine, only 4 ounces as compared with 15 ounces; of smoking opium, 1,851 ounces 161 grains (1941 figures not given); of marihuana, 11,830 ounces of bulk marihuana and 32,817 marihuana cigarettes (comparable 1941 figures not given). The bureau takes issue with the contention recently advanced that marihuana does not give rise to antisocial behavior and cites authorities in support of its views. Three establishments were authorized to use raw opium during the year for manufacturing medicinal, powdered and granulated opium and for extracting alkaloids for sale or export as such. A fourth establishment was authorized to use raw opium in the extracting of alkaloids for use exclusively in the manufac-

ture of its specialty. Four additional establishments were authorized to procure and use comparatively small quantities of raw opium for the purpose of manufacturing medicinal opium, tinctures and extracts. Two establishments were authorized to import coca leaves for the purpose of producing cocaine, one of which was authorized in addition to import a supply of coca leaves for the purpose of manufacturing therefrom a non-narcotic flavoring extract. The report concludes with a number of tables reflecting the results of law enforcement activities engaged in during the year.

Textbook of Midwifery. By Wilfred Shaw, M.A., M.D., F.R.C.S., Physician-Accoucheur in Charge of Out-Patients, St. Bartholomew's Hospital, London. Fabrikoid. Price, 21s. Pp. 588, with 246 illustrations. London: J. & A. Churchill, Ltd., 1943.

This is an outgrowth of the author's lectures and instruction to medical students at St. Bartholomew's Hospital. The material is well organized and presented logically and clearly. It should serve as an admirable textbook for students and practitioners. Although there is a considerable difference in the practice of obstetrics in the United States and Great Britain, fundamental conditions remain the same. Most of the normal cases are under the care of midwives in England, and the majority of women are delivered by general practitioners in this country. For these reasons the author suggests a careful screening of patients so that parturition can be kept as natural as possible in normal women; but when complications arise they should be managed by competent specialists. This textbook, in common with most books in the specialty, retains many time honored practices that have been made obsolete by the advances in medicine and the development of safer and better procedures. The introduction of ergonovine has made obsolete the use of a hot intrauterine douche for the treatment of post-partum hemorrhage as a result of uterine atony. The premature induction of labor for cephalopelvic disproportion is still advocated by the author, but in the United States this procedure has been entirely replaced by trial labor and the low or cervical cesarean section in case of failure. In the treatment of placenta previa, uterine and vaginal tamponades are dangerous and have no place in modern obstetrics. The use of a bag and perhaps Braxton Hick's version is rapidly being replaced by safer procedures. On the other hand, the use of sulfonamides prophylactically in difficult deliveries represents a modern approach to the treatment of infections which may have some virtue. The author is to be congratulated on writing an excellent textbook during so critical a period in the life of his country.

An Introduction to Sociology and Social Problems: A Textbook for Nurses. By Deborah MacLurg Jensen, R.N., B.Sc., M.A., Instructor in Sociology and Social Problems at Schools of Nursing of St. Louis City Hospital and St. Luke's Hospital, St. Louis. Second edition. Cloth. Price, \$3.25. Pp. 420, with 78 illustrations. St. Louis: C. V. Mosby Company, 1943.

This textbook for nurses, first published in 1939, follows the same general pattern as the first edition but has been completely rewritten. It is organized into eleven units. Unit I consists of one chapter concerned with the orientation of the nurse in a changing society. Unit II has three chapters dealing respectively with personality development, social groups and racial and nationality groups. In unit III are seven chapters dealing with social institutions, including the family, religious, economic and governmental institutions, professional nursing as a social institution and the interdependence of social institutions. Unit IV contains four chapters dealing with community organizations of various kinds and the place of the nurse in relation to them. Unit V consists of two chapters dealing with social change. A single chapter comprises unit VI, having to do with social problems in nursing service. Unit VII is composed of four chapters dealing with social problems arising from biologic sources, that is disease and physical deficiency; in this unit is a chapter on medical social work. Unit VIII deals in one chapter with mental diseases, mental hygiene and nursing. In unit IX are two chapters about social problems from economic sources. Unit X discusses social problems from cultural sources, devoting one chapter each to child welfare, the aged, crime and miscellaneous problems. Unit XI deals in three chap-

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Gastric and Duodenal Reactions in Chronic Appendicitis. C. Bonarino Udaondo.—p. 1922.

*Infantile Paralysis: Study of a Recent Epidemic in Argentina. D. Vivoli and N. S. Loizaga.—p. 1940.

Infantile Paralysis.—An epidemic of an infectious disease presenting clinical features of poliomyelitis occurred in Argentina during the period 1942-1943. The incidence was higher in infancy and childhood and the clinical manifestations were essentially those of an acute infectious illness followed by partial or complete muscular paralysis affecting predominantly the limbs. Forms of spinal, bulbar and encephalitic poliomyelitis were clinically recognized. A number of patients died, and in the microscopic examination Vivoli and Loizaga found spherical or falciform corpuscles, sized 2.5 to 4.5 microns, located in the extracellular spaces and in the cytoplasm of macrophagic cells of the spinal cord, medulla, oblongata, intumescence, brain, liver, intestine and lymph nodes. Fragments of the spinal cord of 2 patients injected intraperitoneally or by mouth into rabbits and guinea pigs caused the death of these animals in a few days. Some of the animals developed paralyzes of the limbs. Pathologic examination showed in the organs of the inoculated animals the presence of the same corpuscles found in the patients. By their morphologic characteristics these small corpuscles were considered to be protozoan organisms, most likely toxoplasma. Attempts to cultivate the micro-organisms failed. According to Vivoli and Loizaga it is impossible to ascertain whether the epidemic was one of poliomyelitis, although the clinical symptoms in all cases were indistinguishable from those of poliomyelitis observed in previous outbreaks in Argentina.

Revista Chilena de Pediatría, Santiago**14:549-628 (Aug.) 1943. Partial Index**

*Meningitis Due to Pfeiffer Bacillus. J. Schwarzenberg I. and B. Montero Sierra.—p. 549.

Sulfathiazole in Therapy of Osteomyelitis: Case W. Galasso A. and S. Finkelstein R.—p. 597.

Meningitis Due to Pfeiffer Bacillus.—Schwarzenberg and Montero Sierra report 6 cases of acute purulent meningitis due to *Haemophilus influenzae*. The meningeal symptoms appeared in the course of inflammation of the respiratory tract. The therapy consisted of administration of sulfonamide preparations in daily doses of 0.30 Gm. of the drug per kilogram of weight and of blood transfusion. It failed in all cases but 1. *Haemophilus influenzae* was identified in the cerebrospinal fluid obtained by ventricular puncture in the course of sulfonamide therapy and shortly before death. It was identified also in the cerebrospinal fluid obtained by lumbar puncture in some cases. Necropsy revealed a diffuse fibrinous purulent leptomeningitis, blockage of ventricles, encephalitis, cerebral abscesses and in some cases purulent pleurisy and septicemia.

Münchener medizinische Wochenschrift, Munich**89:637-658 (July 17) 1942. Partial Index***Indications for Treatment of Suppurative Inflammation of Knee Joint in Wartime and for Amputation. H. Westhues and H. Rüd.—p. 637.
Method of Treatment of Syphilis by Dietetics and Cold Water. W. Richter.—p. 641.

*Changes in Stored Placental Blood. H. D. Ellenbeck and J. Carlblom.—p. 644.

*Changes in Cardiac Muscle. H. Ahlrigs-mann. p. 646.

*Carcinoma. G. Schulte and H. Schütz. p. 648.

*Rheumatism. E. L. Luft.—p. 651.

New Type of Silver Nitrate Points (Nitretten) C. Feijers.—p. 651.
Lichen Urticatus Produced by Noxious Insects. I. Hamburger.—p. 652.

the knee but will be associated with much more danger for the leg and the life of the wounded. Puncture should be strictly limited to early cases of blood extravasation or effusion. Radical incisions at the four edges of the joint at the same time and continuous irrigation immediately after the incisions were made may be practiced only in cases of pseudophlegmon in the presence of collateral edema associated with empyema of the knee joint, but irrigation should be discontinued if total empyema does not disappear within a very short time. The method of opening up the knee joint will provide escape of pus but requires an acute angled position of the knee which may be impossible, owing to additional wounds of the leg. Conservatism should be the rule with regard to indications for amputation. The problem of saving the leg is first and foremost a problem of adequate postoperative immobilization which will provide control of suppuration and will facilitate change of dressing. A gravitation abscess may make treatment more difficult but need not be considered as indication for amputation, whereas an erysipelatous phlegmon should be. Blood transfusions, acid diet and exposure to air and sunlight may help to avoid amputation. Amputation may be indicated in cases in which the general condition has become worse in spite of local improvement and should be performed in the presence of local or general septic symptoms before the clinical picture of sepsis has been developed. Conservatism with regard to amputation does not entail an increase in the mortality rate.

Changes in Stored Placental Blood.—Ellenbeck and Carlblom state that stored blood of the umbilical cord undergoes certain changes and that its value compared to that of fresh blood is reduced. Its behavior has been the same as that of stored donor blood. For the first fourteen days changes in stored placental blood have been less definite than is reported in the literature with regard to stored donor blood. That applies to the disappearance of neutrophil leukocytes, to the behavior of the albumin-globulin quotient and to the increase of the potassium content of plasma.

Insulin Therapy of Carcinoma.—In the treatment of 25 patients with carcinoma, Schulte and Schütz employed Brüning's method, consisting of the administration of protamine zinc insulin combined with a low carbohydrate diet. Continuous blood sugar examinations were performed but proved of little value, since the blood sugar level did not reflect accurately the local or general effect of insulin on the organism afflicted with tumor. A high degree of tolerance to insulin similar to that in old persons with diabetes mellitus could not be demonstrated. Pronounced susceptibility to insulin of emaciated patients with carcinoma placed on a liquid-pulp diet corresponded to that of lean patients with diabetes mellitus on a low diet, as experienced by American authors. Euphoria has been the prominent characteristic of the effect of insulin therapy in carcinoma. Psychic ups and downs, however, have been observed, but these may be due to difference in the absorption rapidity of protamine zinc insulin. An objective direct effect on the tumor could not be demonstrated on roentgenologic examination, although an improvement of deglutition was manifest in cases of carcinoma of the esophagus which reacted to insulin. Complete failure of insulin was found in a case of carcinoma of the cardia in which no subjective or objective improvement could be demonstrated. The temporary analgesic effect of insulin resulted in almost complete disappearance of pain in a few cases and in a peculiar, somewhat dull pain in others; but pain became even worse when insulin therapy was discontinued. An analgesic effect was not manifest in some cases in which cancer was demonstrated on microscopic examination. Increase in appetite was noted in some patients with a resulting increase in weight of from 1 to 2 Kg., but considerable loss in weight was likewise associated with good appetite and large food intake. The peak of the insulin effect occurred within eight to ten days and was occasionally prolonged for two months. A true palliative effect cannot be attributed to insulin therapy of carcinoma. Roentgen therapy was practiced after insulin therapy, but tolerance to roentgen rays did not improve and a definite effect on the tumor could not be demonstrated. Insulin therapy may be only occasionally employed to alleviate pain and to improve a depressive mood in patients with carcinoma.

Treatment of Suppurative Inflammation of Knee Joint.—Westhues and Rüd emphasize the importance of radical surgical intervention in cases of suppurative inflammation of knee joint. In wartime surgeons should make a rule that Lawen's method of frontal resection of the condyle or the even more radical method of resection of knee joint should be practiced. The latter method should be economically performed by chiseling off a narrow disk of bony cartilage from the condyle of the femur, including particularly the posterior parts of the condyle. Less radical intervention will not prevent stiffness of

Book Notices

Traffic in Opium and Other Dangerous Drugs for the Year Ended December 31, 1942. Report by the Government of the United States of America. U. S. Treasury Department, Bureau of Narcotics. Cloth. Pp. 66, with 3 illustrations. Washington, D. C.: Government Printing Office, 1943.

This document, covering the calendar year 1942, constitutes the report of the government of the United States on the traffic in opium and other dangerous drugs for distribution through the Secretary of State to the nations signatory to the international drug conventions of 1912 and 1931. According to the report, reserve supplies of opium now stored in this country are ample to fill medical and scientific needs for several years. The number of nonmedical drug addicts in this country is estimated at no more than 1 in every 3,000 of the population, a reduction of at least 66 per cent in the past two decades. Vigilance must be exercised, however, to maintain this ratio of reduction, since war conditions frequently beget a relaxation of drug control, as has already occurred in Iran. In its analysis of the illicit traffic in narcotics, the Bureau of Narcotics records in this report that, along with Iran and Cuba, Mexico has now become the principal source of smuggled drugs seized in the illicit traffic throughout the United States. On the Mexican border, seizures of smoking opium were thirty times as large as in 1941, the major seizure during the year consisting of 27 pounds 3 ounces taken from a Mexican at Yuma, Ariz. Morphine, which formerly ranked next to heroin as a favorite drug of addiction, was extremely scarce. There were limited quantities of morphine sulfate available at extremely high prices, but morphine hydrochloride, with the exception of two seizures in Texas, was practically nonexistent on the illicit market. Heroin was obtainable in some sections of the country at very high prices but was often so highly adulterated as to be almost valueless so far as the maintenance of addiction was concerned. As a result of bootleg sources being greatly diminished there was an increased trend toward robberies and thefts from physicians' offices and drug stores. The adoption of measures to safeguard these supplies is urged by the Bureau of Narcotics. In states which permit the sale of paregoric without prescriptions, addicts purchase the drug in increasingly larger amounts and with accelerated frequency. By what might be designated a "cracking process," opium may be salvaged from paregoric, which the addict uses by hypodermic injection or orally. Compared with Canada, where the retail sale of paregoric is limited to prescriptions, the per capita consumption of this preparation in the United States is about fifteen times as high. The bureau recommends that the sale of paregoric be placed on a prescription basis. In the opinion of the bureau the most troublesome type of diversion of narcotic drugs from legitimate channels is that represented by the sale of morphine or of so-called morphine prescriptions by the relatively few unethical physicians who for financial gain descend to the level of and replace the drug pedler. Reference in detail is made to the case of one physician who issued 1,696 prescriptions between July 1, 1941 and Sept. 23, 1942 calling for a total of 37,602 $\frac{1}{4}$ grain morphine tablets. In addition, this physician purchased on official order forms 7,000 $\frac{1}{4}$ grain morphine tablets, making a total of 44,602 tablets dispensed or prescribed. This physician practiced in a small town with a population of 425. The total quantity of morphine seized during the year was 137 ounces, as compared with 96 ounces seized in 1941; of heroin, 879 ounces as compared with 922 ounces; of cocaine, only 4 ounces as compared with 15 ounces; of smoking opium, 1,851 ounces 161 grains (1941 figures not given); of marihuana, 11,830 ounces of bulk marihuana and 32,817 marihuana cigarettes (comparable 1941 figures not given). The bureau takes issue with the contention recently advanced that marihuana does not give rise to antisocial behavior and cites authorities in support of its views. Three establishments were authorized to use raw opium during the year for manufacturing medicinal; powdered and granulated opium and for extracting alkaloids for sale or export as such. A fourth establishment was authorized to use raw opium in the extracting of alkaloids for use exclusively in the manufac-

ture of its specialty. Four additional establishments were authorized to procure and use comparatively small quantities of raw opium for the purpose of manufacturing medicinal opium, tinctures and extracts. Two establishments were authorized to import coca leaves for the purpose of producing cocaine, one of which was authorized in addition to import a supply of coca leaves for the purpose of manufacturing therefrom a non-narcotic flavoring extract. The report concludes with a number of tables reflecting the results of law enforcement activities engaged in during the year.

Textbook of Midwifery. By Wilfred Shaw, M.A., M.D., F.R.C.S., Physician-Accoucheur in Charge of Out-Patients, St. Bartholomew's Hospital, London. Fabrikoid. Price, 21s. Pp. 588, with 246 illustrations. London: J. & A. Churchill, Ltd., 1943.

This is an outgrowth of the author's lectures and instruction to medical students at St. Bartholomew's Hospital. The material is well organized and presented logically and clearly. It should serve as an admirable textbook for students and practitioners. Although there is a considerable difference in the practice of obstetrics in the United States and Great Britain, fundamental conditions remain the same. Most of the normal cases are under the care of midwives in England, and the majority of women are delivered by general practitioners in this country. For these reasons the author suggests a careful screening of patients so that parturition can be kept as natural as possible in normal women; but when complications arise they should be managed by competent specialists. This textbook, in common with most books in the specialty, retains many time honored practices that have been made obsolete by the advances in medicine and the development of safer and better procedures. The introduction of ergonovine has made obsolete the use of a hot intrauterine douche for the treatment of post-partum hemorrhage as a result of uterine atony. The premature induction of labor for cephalopelvic disproportion is still advocated by the author, but in the United States this procedure has been entirely replaced by trial labor and the low or cervical cesarean section in case of failure. In the treatment of placenta previa, uterine and vaginal tamponades are dangerous and have no place in modern obstetrics. The use of a bag and perhaps Braxton Hick's version is rapidly being replaced by safer procedures. On the other hand, the use of sulfonamides prophylactically in difficult deliveries represents a modern approach to the treatment of infections which may have some virtue. The author is to be congratulated on writing an excellent textbook during so critical a period in the life of his country.

An Introduction to Sociology and Social Problems: A Textbook for Nurses. By Deborah MacLurg Jensen, R.N., B.Sc., M.A., Instructor in Sociology and Social Problems at Schools of Nursing of St. Louis City Hospital and St. Luke's Hospital, St. Louis. Second edition. Cloth. Price, \$3.25. Pp. 420, with 78 illustrations. St. Louis: C. V. Mosby Company, 1943.

This textbook for nurses, first published in 1939, follows the same general pattern as the first edition but has been completely rewritten. It is organized into eleven units. Unit I consists of one chapter concerned with the orientation of the nurse in a changing society. Unit II has three chapters dealing respectively with personality development, social groups and racial and nationality groups. In unit III are seven chapters dealing with social institutions, including the family, religious, economic and governmental institutions, professional nursing as a social institution and the interdependence of social institutions. Unit IV contains four chapters dealing with community organizations of various kinds and the place of the nurse in relation to them. Unit V consists of two chapters dealing with social change. A single chapter comprises unit VI, having to do with social problems in nursing service. Unit VII is composed of four chapters dealing with social problems arising from biologic sources, that is disease and physical deficiency; in this unit is a chapter on medical social work. Unit VIII deals in one chapter with mental diseases, mental hygiene and nursing. In unit IX are two chapters about social problems from economic sources. Unit X discusses social problems from cultural sources, devoting one chapter each to child welfare, the aged, crime and miscellaneous problems. Unit XI deals in three chap-

"Differential Diagnosis.—The cerebrospinal fluid findings in cases of myxedema may be very similar to those of brain tumor, i. e., an increased pressure and a high protein content. The differential diagnosis is not always possible from the cerebrospinal fluid findings. The estimation of the basal metabolic rate is important in such cases."

The reference to Thompson et al. is Thompson, Phebe K.; Silveus, Esther, and Dailey, Mary E.: The Cerebrospinal Fluid in Myxedema, *Arch. Int. Med.* 44:368 (Sept.) 1929.

An increase in protein in the spinal fluid and the resultant changes in colloidal curves, whether gold or other, are entirely nonspecific so far as a diagnosis of neurosyphilis is concerned. The only specific change produced by syphilis in the spinal fluid is a positive Wassermann or flocculation reaction. Increased protein content and colloidal changes may be due to a wide variety of other diseases.

UNDESCENDED TESTES

To the Editor:—I am attempting to obtain the consensus regarding the value of chorionic gonadotropin injections in cryptorchism. I treated a patient aged 10 whose height, weight and general condition were normal except for failure of descent of the right testis. The right testis was not palpable; the left was in the scrotal sac and was normal in size. He received injections of 100 units of chorionic gonadotropin three times weekly for a total of eighty injections (8,000 units). About midway in this therapy the right testis became palpable in the lower part of the inguinal canal. Toward the end of the therapy the testis would almost reach the scrotal sac, but on palpation it would recede. There was some increase in size since it was first palpable, but it still was smaller than the left. Four years later (three years after conclusion of therapy) he was operated on for right cryptorchism. I saw him again recently, one year postoperatively, and his right testis is palpable at the top of the scrotal sac, recedes on palpation and is smaller than the left. I have advised further hypodermic medication. The surgeon ridicules the suggestion, as he also ridiculed the original therapy. Was the original therapy wrong? I understand this to be the proper preoperative procedure. Is it advisable to resume gonadotropin medication now in order to increase the size of the testis and help bring it down into proper position in the scrotal sac?

M. C. Rosenkrantz, M.D., New York.

ANSWER:—It is generally agreed by those who have done considerable clinical investigation on the effect of endocrine therapy in producing descent of testes that this form of treatment in the human being will bring down not more than 25 per cent of the total number of undescended testes.

The original therapy was not wrong. It would appear that further endocrine therapy with chorionic gonadotropin 500 international units three times a week might be indicated for a short period of time—possibly eight weeks. If the testis does not descend by the time, another surgical attempt should be made to place it definitely in the scrotum. It is doubtful whether endocrine therapy will increase the size of the testes.

NERVE INJURY FROM BITE OF BEAR

To the Editor:—A man was bitten by a bear in Yellowstone one year ago, the teeth penetrating the skin of the upper thumb, forefinger and left cutaneous fold. Healing occurred promptly without infection or medical attention. Two months later the patient had a mild febrile attack simulating a light influenza. Following this a general decline in health and a loss of weight were suffered. Tonsillectomy was performed six months later on the advice of the family physician. There followed a slow but moderate general improvement. Meanwhile and continuing to date a loss of strength has occurred in the left thumb and forefinger with pronounced atrophy of the muscles involved. Could you throw some light on this whole affair, especially now with reference to the loss of function of the two digits?

David P. Ferris, M.D., St. Louis.

ANSWER:—This man probably has an atrophy of the first dorsal interosseus muscle on the left side due to an injury of its nerve supply, that is, muscular branch of the left ulnar nerve. Of course the extensors and flexors of the thumb and index fingers may also have been injured. The query does not mention the exact muscles involved. The atrophy and weakness of the thumb and index finger are due to the original bear bite.

PREGNANCY AND ABORTION

To the Editor:—A woman had a miscarriage in August 1943 during the first part of the third month of her first pregnancy. Before her pregnancy an obstetrician said she was normal internally and it would be easy for her to become pregnant. What should be done to prevent future miscarriages? Are hormones required? The patient has had two normal periods since her miscarriage. How soon would it be safe to try for the second pregnancy?

M.D., New Mexico.

ANSWER:—It is not unusual for the first pregnancy to end in abortion, even though the pelvic organs are entirely normal. In many instances the embryo or its covering are abnormal. As a rule, no special precautions are necessary during the next pregnancy. It may be well to have a basal metabolism deter-

mination and, if the rate is subnormal, thyroid can be administered during the first half of the gestation. Stimuli, such as coitus, douches and cathartics, should be avoided during the first three months of the gestation. Although many obstetricians suggest an interval of at least six months between pregnancies, there is no good proof that this is necessary.

Patients who have had several abortions and no viable offspring may be placed on a special regimen, which may include progesterone and vitamin E in the form of tocopherols.

THERAPY OF ALCOHOLISM

To the Editor:—What dosage of apomorphine is necessary to produce nausea (or even vomiting) if this drug is placed in alcoholic drinks? I have a patient who is drinking too much at present and it was my idea to produce a nausea by having his wife put apomorphine in his drinks. This was tried on several occasions without success. In one evening a total of 3/10 grain (0.02 Gm.) was used without success. Is this plan advisable? Is it necessary to use larger doses than the usual 1/10 grain (0.0065 Gm.)? Will this drug work effectively by mouth?

M.D., Indiana.

ANSWER:—The action of apomorphine by mouth is so variable and the beneficial results are so doubtful that this form of treatment is not advised. Even when administered by injection, apomorphine has too short a phase of nausea to form a strong and lasting association between the drinking of liquor and the ensuing illness. Also the drug may act as a powerful narcotic causing sleep, which often blots out the memory of discomfort; or it may cause euphoria, which is certainly not conducive to the desired conditioned reflex. These facts are pointed out by Voegtlin, Lamere and Broz (*Quart. J. Stud. Alc.* 1:501 [Dec.] 1940), who call attention to the danger and futility of using apomorphine in this way. They recommend the injection of emetine followed by the exhibition of a variety of alcoholic drinks, the dosage of emetine and timing being adjusted so that nausea will follow the sight, smell and taste of liquor.

HAZARDS FROM SILICON AND FLUORIDES

To the Editor:—In a steel factory the question has arisen as to certain occupational hazards. The compound CaSi_2 containing 3 per cent excess silicon metal is used as a reducing agent for electric furnace slags. The compound must be ground before using. The grinding operation raises a considerable amount of dust of the material. Can this have any injurious effect on the workers? The electric furnace process is accompanied by the production of clouds of the following materials: Fe_2O_3 , SiF_4 , F_2 , CaC_2 and SO_2 . The fluorine compounds can be detected by their characteristic irritating odor, but aside from causing temporary discomfort there is no other obvious effect on the men. Would constant inhalations of any of these materials cause any ill effects? Some of the men develop skin eruptions on the wrists and ankles. Could this be due to exposure to burnt lime (CaO)?

I. T. Zeckwer, M.D., Philadelphia.

ANSWER:—No specific information is available on the physiologic action of CaSi_2 , but in general silicides like carbides (except calcium carbide) are comparatively inert materials. Fluorine is a recognized pulmonary irritant. The gas silicon tetrafluoride, on contact with water, forms hydrofluosilicic acid, but this is not noticeably irritating unless heated. All of these products liberated as fumes in the process described should be regarded as possible acute irritants. Whether they cause progressive chronic disease of the skin or respiratory tract is unknown.

FETAL ASPHYXIA

To the Editor:—I was called to attend a woman in pregnancy who, to the best calculation, was in the seventh month of gestation. She was in pain but not of the rhythmic type of labor. Examination disclosed the amniotic sac presenting intact with the head palpable. No dilated uterine cervix could be found. The membrane was ruptured and the labor terminated in a few minutes, with a little manipulation. An asphyxiated child was delivered with cessation of heart beat. On exposure to the air its fingers twitched a little, showing that death was recent. The cord was severed immediately but did not bleed. No time was lost in making a uterine examination, which disclosed a contracted cervix and retained placenta therein. This was removed by disintegration with some difficulty. This is what had happened: The fetus with the membrane had been expelled from the uterus and had remained in the vagina while the uterus had clamped down on this placenta, thereby cutting off the circulation of blood to the fetus, which caused the asphyxiation. I have carefully searched the literature and cannot find any parallel case. Will you please tell me if there is any such case on record?

T. H. Standlee, M.D., Mirando City, Texas.

ANSWER:—In all likelihood the baby expired because of some interference with its circulation. Fetal asphyxia is often an accompaniment of the second stage of labor and it may prove fatal. The contraction of the cervix and the lower uterine segment could have occurred after the birth of the baby. Such contractions more often following the use of oxytocic drugs than in normal delivery. The clinical picture described is by no means rare, particularly in previable and premature deliveries.

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CLINICAL USE OF THE CHAMBERLAIN TECHNIC IN SACROILIAC CONDITIONS

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The question of sacroiliac slip has been discussed for years. Snelling published a paper on this subject in 1870. Goldthwaite and Osgood made an important contribution in 1905. Fick, Smith-Petersen and others have also made their contributions. There seems to be no question at the present time but that the sacroiliac joint is a movable joint.

Chamberlain in 1919 first began to use his x-ray technic of demonstrating slipping of the sacroiliac joints. He read a report on this subject at a meeting of the American Roentgen Ray Society in September 1922. Allen published the description of a somewhat similar technic in 1923. Chamberlain¹ has published papers in 1930 and 1932 on this subject.

Chamberlain states that "there is no reason to expect the ordinary anteroposterior view of the sacroiliac region to reveal the normal or abnormal movement occurring in these joints because motion of the sacroiliac joint is not in a direction which could be shown by any sort of x-ray study of the joint itself. The sacroiliac motion, when it occurs, is rotatory, and the rotation takes place within an axis which is perpendicular to the joint surface. The place to look for evidence of sacroiliac joint motion is at the symphysis pubis, where it is magnified and measurable." Chamberlain makes first the ordinary routine stereoscopic posterior views which are made with the patient supine on the Potter-Buckey diaphragm table, and with the symphysis pubis and the entire pelvic rim in the field of view. Also a lateral film is taken, either right or left, centered over the lumbosacral joint.

Next the special technic is then described by him as follows: "Expose the pair of special anterior projections of the pubis, the patient standing with weight bearing on the alternate leg. In these views it is advisable to have the Potter-Buckey diaphragm mounted in the erect position. The patient is standing upon a pair of steps approximately 3 to 6 inches high facing the Potter-Buckey diaphragm. The first film is labeled "right" and the label is placed at the film margin, toward the patient's right, to indicate weight bearing on the right leg. The step is removed from under the left leg and the first exposure is made while the left

leg is hanging free. The label is then changed to "left" and is placed at the film margin toward the patient's left. The step is then placed under the left foot, and the one under the right foot is removed. The second film is exposed with weight bearing on the left leg, the right leg hanging free." We take also a third check x-ray film with the patient standing on both feet.

Chamberlain states that "a scale is applied first to one of the weight bearing films and then to the other in such a manner that the vertical line on the scale lies in the soft tissue zone, midway between the bony outlines of the two pubes. The difference in the height of the two sides of the pubes is then measured."

He states that in 90 per cent of his cases the sacroiliac symptoms have been on the side of the high pubic bone. He states that "the normal movements range from nothing to 0.5 mm. in the male and from nothing to 1.5 mm. in the nonpregnant female.

This x-ray technic has been used by one of us, V. L. P., a roentgenologist, and the senior author for the past two and one-half years in 144 cases. A careful history is taken, and the ordinary clinical tests used in low back examinations have been made in all cases. The methods of Nutter, Pitkin² and others demonstrating undue mobility of the sacroiliac joint clinically have not been made. The total of 144 cases studied were cases which seemed to be somewhat obscure so far as their diagnosis was concerned. These were consecutive cases and were not selected.

One hundred and seventeen of these patients were male and 27 were female. Sacroiliac slip occurred in 35 of the 117 cases in males, or 29.9 per cent. It occurred in 16 of the 27 cases in females, or 59.2 per cent.

Thirty-five of the 144 cases were private cases and 109 were compensation cases. Twenty-three, or 65.7 per cent, of the private cases showed a slip. Twenty-eight, or 25.7 per cent, of the compensation cases showed slipping. It is believed that this examination is especially useful in compensation cases, as it is well known that they are more difficult to evaluate than ordinary private cases.

The onset of the trouble was due to an accident in 131, or 91 per cent of the whole series of cases, and the onset was gradual in 13, or 9 per cent of the whole series. In the cases showing sacroiliac slip 43, or 84 per cent, were due to accident and 8, or 16 per cent, were gradual in their onset. Thus it seems that while accidents predominate as the cause of slipping it is by no means unusual to see slipping in cases without previous history of accident.

Low back pain was the chief complaint in all of these cases. Associated leg pain was found in 65, or 46 per cent, of the whole series and in 24, or 46 per

1. Chamberlain, W. E.: The X-Ray Examination of the Sacroiliac Joint, Delaware M. J. 4:195-201, 1932; The Symphysis Pubis in the Roentgen Examination of the Sacroiliac Joint, Am. J. Roentgenol. 24:621-625, 1930.

2. Pitkin, H. C., and Pheasant, H. C.: Sacroarthrogenetic Telalgia: I. A Study of Referred Pain, J. Bone & Joint Surg. 18:111-133 (Jan.) 1936.

cent, of the cases showing sacroiliac slip. Then in 54 per cent of the cases leg pain was absent and the pain was confined to the lower back and gluteal region.

A routine back examination was made in these cases with special reference to list, limitation of straight leg raising, limitation of spine motions, Trendelenburg, Gaenslen, Ober and Ely signs, compression and separation of the pelvis, and points of maximum tenderness. The question of posture and limp were all considered.



Fig. 1 (patient T.).—Appearance with patient standing on both feet.

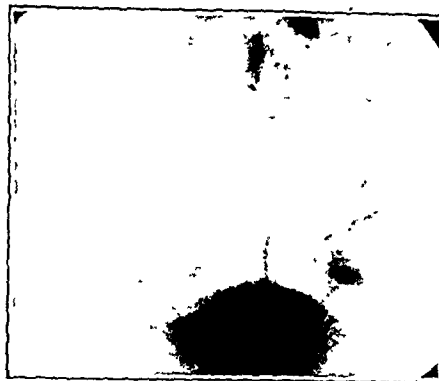


Fig. 2 (patient T.).—Patient standing on the left foot: no displacement in the left sacroiliac joint.

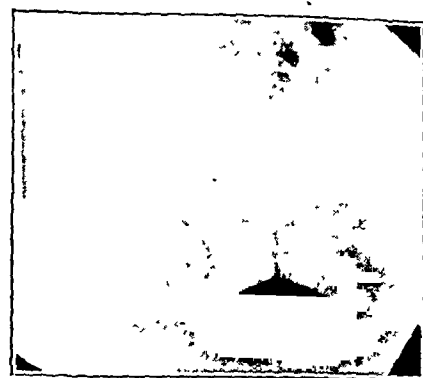


Fig. 3 (patient T.).—Patient standing on right foot: displacement of 2.5 mm.

It is interesting to note that a list was found in comparatively few of these cases.

On the other hand, straight leg raising was found to be limited in 59 per cent of the whole series of 144 cases and was found in 93 per cent of the 51 cases showing sacroiliac slip. Thus it can be said that a normal straight leg raising test will almost eliminate a sacroiliac slip.

As was to be expected, there was considerable limitation of spine motion, that is as regards motion in the lumbar spine, in many cases. This point was of little use in differentiating sacroiliac lesions from other conditions, however.

The Trendelenburg test was positive in comparatively few cases and was found to be of little help.

The Gaenslen test was found to be positive in a little over one fifth of the whole series of 144 cases and also

percentage of the cases. It did not seem to be of definite help in making the diagnosis of this condition.

As was to be expected, the sacroiliac joint was the usual point of maximum tenderness. It was present in 76, or 52 per cent, of the whole series of 144 cases and in 30, or 58.8 per cent, of the cases showing sacroiliac slip. Sciatic tenderness was present in less than 1 per cent of the whole series but in 4 cases, or 7 per cent, of the cases showing sacroiliac slip.

All patients showing definite sciatic symptoms were referred to a neurologic surgeon for further neurologic studies and studies with iodized oil if indicated.

Poor posture was found in a comparatively small percentage of these cases showing sacroiliac slip, 3 cases, or 5.8 per cent. A limp was found in only 5 cases, or 10 per cent, of the cases showing sacroiliac slip.

The x-ray examination showed sclerosis in 35, or 24 per cent, of the whole series of 144 cases and this was present in only 8 cases, or 15 per cent, of the cases showing sacroiliac slip.

It has been found by Pitkin and others that sacroiliac slips are present more commonly on the left side than on the right. In our series 15 cases, or 29.4 per cent, showed slipping on the right side and 27 cases, or 52.9 per cent, showed slipping on the left. Nine



Fig. 4 (patient B.).—Appearance with patient standing on both feet.



Fig. 5 (patient B.).—Patient standing on left foot with displacement of 1.5 mm.



Fig. 6 (patient B.).—Patient standing on right foot, displacement of 3 mm.

in about the same percentage in the cases showing a sacroiliac slip.

The Ober test was found to be positive in a somewhat higher percentage of the cases. It was positive in 40 per cent of the whole series of 144 cases and in 35 per cent of the cases showing sacroiliac slip.

The Ely test was found to be positive in about one third of the whole series and in only about 25 per cent of the cases showing a sacroiliac slip.

Pain on attempted separation or compression of the pelvis was found to be present in a comparatively small

cases, or 17.6 per cent, had a bilateral slipping by x-ray examination.

Twenty-nine cases, or 20 per cent of the whole series, showed positive sacroiliac signs and the x-ray examination showed a slipping on the same side. Eight cases, or 5.5 per cent of the whole series, showed positive sacroiliac signs on both sides and the x-ray examination showed slipping on both sides. Seventy-one cases, or 49 per cent of the whole series, showed sacroiliac signs which were predominantly negative on both sides and the x-ray examinations were negative on both sides.

Two cases, or 1.3 per cent of the whole series, showed positive sacroiliac signs on both sides and the x-ray examination showed a slipping on one side only. One case, or 0.67 per cent of the whole series, showed positive sacroiliac signs on one side and x-ray examination showed slipping on both sides.

On the other hand, 8 cases, or 5.5 per cent of the whole series, showed sacroiliac signs which were inconclusive and the x-ray examination showed a slipping on the same side. In 6 cases, or 4.16 per cent of the whole series, the sacroiliac signs were inconclusive and the x-ray examination showed a slipping on the opposite side. Also 14 cases, or 9.7 per cent of the whole series, showed sacroiliac signs which were positive on one side and the x-ray examination was negative. Five cases, or 3.4 per cent of the whole series, showed sacroiliac signs which were positive on both sides and x-ray examination were negative bilaterally.

Now, to recapitulate, the sacroiliac signs and x-ray findings agreed completely in 108 cases, or 74.5 per cent of the whole series. The sacroiliac signs and x-ray findings agreed partially in 11 cases, or 7.6 per cent. Thus, in a total of 82.1 per cent the x-ray examination showed agreement with the essential clinical findings. On the other hand, the sacroiliac signs and the x-ray findings were in disagreement in 25 cases, or 17.9 per cent.

The x-ray films were available for review in 42 of the 51 cases showing sacro-iliac slip. Of these cases the right sacroiliac joint was involved in 16 males and 10 females. There was an average of 1.9 mm. of slipping in the male, disregarding the slip in 1 case which was 10 mm. There was an average slipping of 1.8 mm. in the female.

The left sacroiliac joint showed 16 males involved with an average slipping of 1.47 mm., and 11 females with an average slipping of 1.68 mm.

Of the 42 cases involving 53 joints in which x-ray measurements were made, 37 of these cases and 46 joints showed slipping above the normal of 0.5 mm. in the male and of 1.5 or more millimeters in the female. Thirty of these joints were in the male and 16 in the female.

An analysis of these 37 cases is of interest. Twenty-one out of these 37 cases, or 56 per cent, were cases in which the sacroiliac signs were positive and the x-ray examinations showed slipping on the same side. In 5 of these cases, or 13.5 per cent, the sacroiliac signs were positive on both sides and the x-ray examinations showed a slipping on both sides. In a total of 26 out of 37 cases, or 70 per cent, there was complete agreement between the x-ray and the clinical findings. In 2 cases, or 5.4 per cent, the sacroiliac signs were positive on both sides and x-ray examinations showed slipping on one side only. In 2 cases sacroiliac signs were positive on one side and the x-ray examinations showed slipping on both sides. In 5 cases, or 13.5 per cent, the sacroiliac signs were inconclusive and the x-ray examinations showed slipping on the same side. In 2 cases the sacroiliac signs were inconclusive and the x-ray examinations showed slipping on the opposite side.

CONCLUSION

The so-called Chamberlain technic of x-ray examination of the sacroiliac joint is worth while and is accurate in 70 to 80 per cent of the cases. It should be used in doubtful cases of sacroiliac joint conditions.

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FETAL AND NEONATAL MORTALITY IN PREGNANCIES COMPLICATED BY DIABETES MELLITUS

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About 30 per cent of all the pregnancies complicated by diabetes mellitus result in the death of the fetus or the newborn infant. The cause of this high mortality has remained obscure. No significant reduction in fetal deaths has been shown to have occurred since insulin has come into use. Several factors have been held responsible for the high death rate. These include the degree of care with which the maternal diabetes has been regulated, the presence of such complications of pregnancy as toxemia and hydramnios, the frequent occurrence of large fetuses, the increased incidence of congenital anomalies and the hypoglycemia in the live-born infant. There is no general agreement, however, that any one or that all of these factors together can explain satisfactorily the fetal mortality.¹

A recent study by Miller and Wilson² has brought out the fact that infants born of diabetic mothers may have cardiac hypertrophy and excessive erythropoiesis in the liver with large numbers of nucleated red blood cells in the peripheral blood during the first days of life. The cardiac and hepatic changes were found by them associated sometimes with hyperplasia of the islands of Langerhans in overweight fetuses. The anatomic changes described were noted to have been present in 2 instances before maternal diabetes was manifest. The frequent occurrence of this syndrome in infants born to diabetic mothers suggested that there might be some causal relationship between it and diabetes mellitus. The fact that it was sometimes present before the onset of recognizable signs and symptoms of diabetes indicated that the anatomic changes were not related to

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Many persons contributed information obtained from the records of patients in the three hospitals, especially Dr. Arthur H. Morse and the staff of the Department of Obstetrics and Gynecology, Dr. John P. Peters and the members of the Metabolism Service of the Department of Medicine, Yale University School of Medicine, Dr. Edward Tolstoi of the Department of Medicine and Dr. S. Z. Levine of the Department of Pediatrics, Cornell University Medical College.

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the hyperglycemia in the mother. These observations were based on autopsies done on infants at the Boston Lying-in Hospital, the New Haven Hospital and the New York Hospital. The anatomic changes reported by Miller and Wilson were the result of a preliminary survey. A more detailed study of the postmortem material from the three hospitals is to be made in the near future under the direction of Dr. Arthur T. Hertig of the Boston Lying-in Hospital. It was felt that while the autopsy material was being studied a survey of all the pregnancies complicated by diabetes in the three hospitals should be made. The purpose of the investigation was to evaluate all the factors which might have a bearing on the survival of the fetus. Studies of this kind have been made before, but seldom has there been an opportunity to report enough cases to give statistical significance to the results.

The 123 mothers had 143 pregnancies and there were 146 births, the results of which are shown in table 1. The fetal and neonatal mortality in the diabetic pregnancies have been compared to those in 3,079 consecutive births which occurred in the New Haven Hospital from 1928 to 1932 inclusively.⁴ The total mortality among the 3,079 births was 5.4 per cent. The mortality among the 146 births to diabetic mothers was 29.4 per cent, or about five times higher than in the non-diabetic group. The fetal mortality was six times and the neonatal mortality was four times higher in the diabetic group than in the non-diabetic. Twenty-two of the 30 fetal deaths were macerated fetuses. The high death rate among the fetuses and liveborn infants of diabetic mothers is not related primarily to the severity of the maternal diabetes. In the group of 123 diabetic mothers there were 42 who were classified as having diabetes but who did not require insulin at

TABLE 1.—Fetal and Neonatal Deaths in Diabetic and Nondiabetic Pregnancies, Showing Effect of Mild Diabetes and Uncomplicated Pregnancies on the Fetal and Neonatal Mortality.

Group	Births	Fetal Deaths *		Neonatal Deaths *		Total Deaths		Chi Square
		No.	%	No.	%	No.	%	
1. Nondiabetic.....	3,079	99	3.2	67	2.1	166	5.4	
2. Total diabetic.....	116	30	20.5	13	8.9	43	29.4	133
(a) With complications of pregnancy.....	55	17	30.9	7	12.7	24	43.6	131
3. Diabetic, not taking insulin.....	48	7	14.6	4	8.7	11	22.9	27.2
(a) Without complications of pregnancy.....	34	4	11.7	3	8.8	7	20.6	13.5

* Fetal deaths include macerated fetuses and other stillborn infants. Neonatal refers to the first ten days of life only. These definitions apply in all subsequent tables.
† Complications of pregnancy were as follows: toxemias of pregnancy (all forms), 35; hydramnios, 16; diabetic acidosis, 4; pyelitis, 4; hypertension, 2; syphilis, 1; placenta previa, 1. Some mothers had more than one complication of pregnancy, but they were counted in the table as having only one.

TABLE 2.—Combined Fetal and Neonatal Mortality Before and After the Onset of Diabetes

	Diabetic										Nondiabetic			
	Insulin Treated			Not Insulin Treated			Total			Chi Square				
	Born	Died	%	Born	Died	%	Born	Died	%		Born	Died	%	Chi Square
After onset of diabetes.....	41	11	27.5	52	11	21.1	93	22	23.6		167	8	4.8	43.4
1-5 years before onset.....	40	16	40.0	30	12	30.7	79	28	35.4	....	104	3	2.8	6.5
6-10 years before onset.....	42	6	11.3	37	4	10.8	79	10	12.6	11.1	79	0	0.0	10.0
11-15 years before onset.....	31	4	15.1	26	4	11.1	67	8	11.9	10.7	48	1	2.1	4.5
16-20 years before onset.....	10	2	20.0	17	2	11.7	27	4	14.7	4.0				

The chi squares in the column marked "Total" represent the significance of the difference between the mortality in the five year period immediately preceding the onset of diabetes and the mortality in each of the other five year periods in the prediabetic era. The chi squares in the column marked "Nondiabetic" refer to the significance of the difference between the mortality in nondiabetic and total diabetic in the corresponding five year periods.

MATERIAL

The material for this study was obtained from the hospital records of all diabetic pregnant women and their offspring admitted to the Boston Lying-in Hospital, the New Haven Hospital and the New York Hospital since 1930, 1928 and 1933 respectively.³ No diabetic mother was accepted for study who was admitted to a hospital for the delivery of a fetus that weighed less than 1,000 Gm. On this account 5 mothers and their fetuses were excluded. There remained 137 mothers who were observed in the three hospitals through 159 pregnancies. There were 162 births. The statistical significance of the results was determined by the chi square test. A chi square of 3.8 or more may be considered as statistically significant.

RESULTS

In the group of 137 mothers there were 123 whose diabetes had its onset either before or during the pregnancy for which they were admitted to the hospital.

any time during pregnancy. The diagnosis of diabetes was made in these 42 mothers on the fact that they had glycosuria with or without symptoms plus the fact that in all but 2 instances either the dextrose tolerance curve was of the diabetic type or the fasting blood sugar was over 140 mg. per hundred cubic centimeters. There were 48 births in 45 pregnancies among the 42 mothers, and the mortality for the infants is shown in group 3, table 1. The combined fetal and neonatal mortality was 22.9 per cent, or four times higher than the mortality in the nondiabetic group. This high death rate among the offspring of the diabetic mothers who did not require insulin is not the result of maternal complications of pregnancy, for the mortality is almost the same even when the maternal complications are excluded as a possible cause (see Group 3a table 1). Under the most favorable conditions the risk to the infant of a diabetic mother is about four times that to the infant born to a nondiabetic woman. In the presence of severe complications of pregnancy in women

4. Hadley, E. E.: Morbidity and Mortality in the Neonatal Period, Thesis, Yale University, 1934.

3. Footnote deleted on proof.

with diabetes, the risk to the infant may be greatly increased. The mortality among the infants whose mothers had severe complications of pregnancy with both mild and severe diabetes was 43.6 per cent (group 2a, table 1). A clear understanding of the cause of the high mortality in diabetic pregnancies will not be had, however, until the explanation for the high mortality in the noncomplicated group is obtained.

There is ample evidence that the fetal and neonatal mortality is extraordinarily high long before the mothers develop symptoms or signs of diabetes. In table 2 there has been presented the results of all the pregnancies exclusive of abortions and miscarriages that occurred in those mothers who had pregnancies both before and after the onset of diabetes. The diabetic mothers in table 2 have been divided into two groups: those whose diabetes required insulin during pregnancy and those whose diabetes was regulated solely by diet. The appearance of the first sign or symptom as recorded in the history was taken as the onset of diabetes in both groups of women. The births and deaths in the two groups have been given not only for the period when diabetes was present but also for the years before the onset of diabetes. The latter period has been arbitrarily divided into periods of five years each. The births and deaths that occurred in a group of 106 nondiabetic mothers whose average age at the time of the birth of their last infant was the same as that of the diabetic women at the time of onset of their diabetes, 34 years, are also given in table 2. The nondiabetic women were unselected consecutive patients admitted to the New Haven Hospital for delivery in 1943. In both the insulin and non-insulin treated diabetic groups the fetal and neonatal mortality follows the same pattern. The number of deaths increases as the onset of diabetes is approached, and in the five year period immediately preceding the appearance of signs and symptoms of the diabetic syndrome the mortality is higher than in any other preceding period. The statistical significance of the increase in mortality as diabetes approaches is demonstrated by combining the data in the insulin treated and non-insulin treated groups and comparing the mortality in the five year period immediately preceding the onset of symptoms with each five year period before it. Furthermore, the mortality for the diabetic group in each one of the five year periods before the onset of diabetes is statistically significantly higher than the mortality in the corresponding five year period in the nondiabetic group. In the five year period immediately preceding the onset of diabetes the mortality is higher than that after diabetes is recognized, but the difference is not statistically a significant one.

It is well known that babies born to diabetic mothers tend to be overweight. This increased birth weight can be shown to antedate in the offspring the appearance of diabetic symptoms and signs in the mother. In table 3 the incidence of babies who weighed over 5 Kg. at birth is given.⁵ In the babies born to mothers before the latter became diabetic a history of a birth weight of 5 Kg. or more was accepted only if the baby had been born in a hospital where accurate weights could be obtained, since histories of home weights are grossly unreliable. The incidence of babies who weighed more than 5 Kg. at birth was 3.9 per cent before diabetes

was diagnosed in the mothers and 6.4 per cent after the onset. Statistically, both of these figures are significantly higher than the incidence of similar babies in the nondiabetic population. The earliest recorded birth weight in excess of 5 Kg. among 256 births was ten years before the appearance of diabetic symptoms.

The excessive size of the fetus has been held by some investigators to be responsible for part of the high mortality in infants born to diabetic mothers. The relation between the birth weight and mortality was studied in this series, and the results are given in table 4. There is nothing in the data of table 4 to indicate that an excessive birth weight decreases the infant's chances for survival. It might be supposed that maceration might influence the birth weights adversely in the lower weight brackets, but even with macerated fetuses eliminated the mortality is no more unfavorable for the infants over 4.5 Kg. than those in the normal range. There were 6 infants with birth weights over 5 Kg. and 2 deaths, indicating possibly that in this very high weight range the mortality does

TABLE 3.—Incidence of Large Babies in Diabetic Pregnancies Before and After the Onset of Diabetes

	Total Births	Births Over 5 Kg.	Chl Square
Nondiabetic (Chicago Lying-in Hospital).....	20,219	14 0.07	
Diabetic			
(a) Before onset.....	256	10 3.9	317
(b) After onset.....	93	6 6.4	382

TABLE 4.—Combined Fetal and Neonatal Mortality in Diabetic Pregnancies According to Birth Weight

Birth Weight, Kg.	Births	Deaths	%	Macerated Fetuses *	Deaths Less Macerated Fetuses	%
1.0-2.5	17	12	70.0	5	7	58.3
2.5-3.5	40	11	27.5	7	4	12.1
3.5-4.5	57	12	21.0	5	7	13.4
4.5-6.0	29	5	17.2	2	3	11.1

* Three macerated fetuses were delivered after thirty-two weeks of gestation but were not weighed and hence were not included.

begin to increase. The mortality is very high in infants under 2.5 Kg., as would be expected in premature infants.

Among the 137 mothers whose records were studied there were 11 who had glycosuria but who could not be considered as having diabetes, as they had either normal fasting blood sugar concentrations or normal dextrose tolerance curves during pregnancy. In 2 instances, cases 6 and 8 of table 5, no tests were done, so that they could not be classified for certain as diabetic and hence were included in this group. In only 1 instance, case 1, did diabetes subsequently develop in a mother. The group of cases in table 5 have been shown because the number of fetal and neonatal deaths, the incidence of large fetuses and the occurrence of cardiac hypertrophy and erythropoiesis in the liver and blood seemed similar to the results observed in the larger group of births among the definitely diabetic mothers shown in the previous tables. There were 4 deaths, in cases 1, 2a, 2b and 3, among the 12 births listed in table 5, or a mortality of 33 per cent. Three of the infants weighed over 5 Kg. at birth, in cases 2b, 3 and 4. In 2 infants an enlarged heart was noted on roentgen examination, cases 1 and 4.

5. The figures for the nondiabetic at the Chicago Lying-in Hospital were obtained from Koff, A. K., and Potter, Edith L., Complications Associated with Excessive Development of Human Fetus, *Am. J. Obst. & Gynec.* 38: 412 (Sept.) 1939.

In the same 2 cases large numbers of erythroblasts were observed in the peripheral blood and in another infant, case 3, there were numerous areas of erythropoiesis in the liver at autopsy.

COMMENT

The belief has long been held that the hyperglycemia in the pregnant diabetic woman is responsible for the large number of fetal and neonatal deaths, the excessive birth weight of some of the infants and the hyperplasia of the islands of Langerhans in the fetal pancreas. This opinion is no longer tenable in the light of the evidence presented here. Fetal and neonatal deaths and the birth of unusually large babies occur with about the same incidence before diabetes becomes manifest as afterward. Hyperplasia of the islands of Langerhans, cardiac hypertrophy and excessive erythropoiesis in the fetal liver, which are found in the newborn of diabetic women, have also been demonstrated to occur in infants before symptoms or signs of diabetes could be recognized in their mothers. There is no reason for assuming that the factor or

found in infants weighing considerably less. Furthermore, there were some women who, although they had several pregnancies before and after the onset of their diabetes, had none that resulted in the death of the fetus or newborn infant. Just why some fetuses escape and why the lethal factor does not repeat itself from one pregnancy to another require an explanation as much as the large number of fetal deaths. Two facts are clear from the present study. The lethal factor for the fetus may be in effect from fifteen to twenty years before the onset of diabetes can be recognized, and the effect of the lethal factor becomes greater as the mother approaches the onset of clinical signs and symptoms of the syndrome. Many other facts will be needed, however, before the relationship between fetal death, overweight fetuses and the eventual production of hyperglycemia in the mother is clarified. White and Hunt have stated that fetal death in the diabetic woman is associated with a high concentration of gonadotropic substance in the maternal serum during the latter part of pregnancy and that the administration of estrogens and progesterone can prevent the large number of

TABLE 5.—Effect of Maternal Glycosuria Without Diabetes on Fetal and Neonatal Mortality.

Case	Symptoms	Glycosuria	Highest Fasting Blood Sugar, Mg. per 100 Cc.	Dextrose Tolerance Curve	Infant	Birth Weight, Kg.	Comment
1	0	+	117	.....	Died 3d day	2.6	45,000 erythroblasts per cu. mm. of blood; large heart by x-ray; mother Rh+; later became diabetic
2a	0	+	116	Normal	Died 2d day	4.3	Atresia pulmonary valve
2b	0	0	100	.....	Stillborn	5.2	Cerebral hemorrhage at autopsy
3	0	+	93	Normal	Stillborn	5.0	Enlarged liver and spleen and erythropoiesis in liver at autopsy
4	0	+	Normal	.....	Lived	5.4	Large heart by x-ray; erythroblasts, 71 per hundred white blood cells
5	0	+	107	.....	Lived*	3.7	
6	0	+	...	.....	Lived	2.7	
7	0	+	106	Normal	Lived	3.4	
8	0	+	...	.....	Lived	3.8	
9	0	+	101	Normal	Lived	4.2	
10	0	+	106	Normal	Lived	3.8	
11	Polydipsia polyuria	+	71	Normal	Lived	3.5	

factors that cause fetal and neonatal deaths and that lead to the production of unusually large infants and the other anatomic changes in the viscera of the fetus during the years before diabetes can be diagnosed are not identical with those that are producing the same results after the syndrome has become established.

The birth of large babies and the frequent occurrence of fetal deaths before the appearance of diabetic symptoms has also been noted by Allen.⁶ According to him "glycosuria is only another manifestation of a condition that may produce larger babies and sometimes kill them before birth." This is a vague statement and is far from being proved, since the nature of the "condition" remains obscure. There is no certainty even that the lethal factor for the fetus is identical either with the one that produces large fetuses or with the one that leads to the visceral changes in the fetus. In the present study no correlation could be found between the birth weight of the infant and the mortality. The number of deaths was no higher in babies that weighed over 4.5 Kg. than in those that weighed from 2.5 to 3.5 and from 3.5 to 4.5 Kg. Although the visceral changes described by Miller and Wilson apparently tend to occur more frequently in fetuses that weigh more than 4 Kg., the changes were also

fatalities.⁷ This contention is not borne out by the investigations of the Smiths, who noted fetal and neonatal deaths in the presence of normal serum levels of gonadotropic substance in the diabetic mothers' bloods⁸ and observed normal infants to be born in spite of decidedly elevated concentrations of gonadotropic substance in other mothers with diabetes.⁹ Whether or not the administration of estrogens and progesterone to the mother during the latter months of pregnancy will prove effective in lowering fetal mortality must await further trial, since White's series of cases is too small to permit any definite conclusions. For obvious reasons the anterior pituitary has been considered by some as playing an important part in the production of large fetuses and the high incidence of fetal and neonatal deaths. Although the role of the anterior pituitary in the production of diabetes has recently received great emphasis, considerably more work must be done before the death of the human fetus and newborn infant and the excessive size

7. White, Priscilla, and Hunt, Hazel: Prediction and Prevention of Pregnancy Accidents in Diabetes, J. A. M. A. **115**:2039 (Dec. 14) 1940.

8. Smith, G. V., and Smith, O. W.: The Anterior Pituitary-Like Hormone in Late Pregnancy Toxemia, Am. J. Obst. & Gynec. **38**:618, 1939.

9. Smith, O. W., and Smith, G. V.: Prolan and Estrin in the Serum and Urine of Diabetic and Nondiabetic Women During Pregnancy, Am. J. Obst. & Gynec. **33**:365 (Oct.) 1937.

6. Allen, E.: Glycosurias of Pregnancy, Am. J. Obst. & Gynec. **38**: 982, 1939.

of the infant can be ascribed to this gland. It is true that the injection of extracts of the anterior pituitary lead to the production of postmature fetuses and a high fetal mortality in animals,¹⁰ but there is no work as yet to suggest that the infants of diabetic mothers have an abnormally prolonged gestation period.

A large percentage of patients in the present study included women who could be classified as mildly diabetic. They had glycosuria, diabetic dextrose tolerance curves and high fasting blood sugars but did not require insulin. There has been a tendency in some clinics to minimize the importance of this group. The evidence presented here indicates that with respect to fetal mortality and the production of somatic and visceral changes in the fetus they are to be considered similar to the infants of women whose diabetes is severe and of long standing.

A special group of 11 mothers were observed who had glycosuria but who could not be diagnosed as diabetic, since the carbohydrate metabolism was otherwise within normal limits. The fact that the offspring of these women showed the same changes and the same poor chances for survival as did those born to mothers with outspoken diabetes indicates that glycosuria in the latter months of pregnancy is not to be regarded as "benign" for the fetus. The importance of even a single observation of dextrose in the urine is revealed in case 4 of table 5. During this particular pregnancy the mother had tests for sugar done on her urine on twenty different occasions, and reducing substances were found only once. The large number of tests were done because she had glycosuria for seven months prior to a previous pregnancy. The twenty tests reveal how completely the glycosuria had subsequently disappeared. In spite of the fact that the evidence of diabetes is practically nil during this pregnancy, the infant was found to weigh 5.4 Kg. at birth, had on roentgen examination an enlarged heart and was found to have 71 erythroblasts per hundred white blood cells in the peripheral blood—a clinical picture that is encountered with considerable frequency in babies of diabetic mothers. The fact that fetal death and pronounced somatic and visceral changes can occur in infants born to women with so little evidence of diabetes, and for many years before diabetes can be considered on any grounds, suggests that there may be occasions when fetal deaths occur and large babies are born and yet the mother may never develop the recognizable signs and symptoms of diabetes. The solution of the cause of fetal death and large babies in pregnant diabetic women may give us more light not only on diabetes but also on the causes of unexplained fetal death.

CONCLUSIONS

1. In pregnancies complicated by diabetes mellitus the fetal and neonatal mortality is about five times higher than that in nondiabetic pregnancies. The fetal and neonatal mortality is as high during the five years immediately preceding the onset of diabetic symptoms as after the syndrome has become established. An increased fetal and neonatal mortality can be observed from fifteen to twenty years before the clinical symptoms and signs of diabetes can be recognized.

2. Infants with a birth weight of 5 Kg. or more are born to women before they become diabetic with

the same high frequency as after diabetic symptoms have appeared. The incidence of infants whose birth weight is 5 Kg. or more is about eighty times higher in pregnancies complicated by diabetes than in non-diabetic pregnancies.

3. The fetal and neonatal mortality is no higher among those infants who weigh 4.5 Kg. or more at birth than among those who weigh between 2.5 and 4.5 Kg.

4. In the presence of mild diabetes (not requiring insulin) and in the absence of maternal complications of pregnancy the fetal and neonatal mortality is four times higher than that in the nondiabetic population. Severe complications of pregnancy in women with diabetes increase the risk to the infant.

5. The presence of glycosuria in the last months of pregnancy in women whose carbohydrate metabolism is otherwise apparently normal is associated with a fetal and neonatal mortality that is as high as that among the offspring of women with definite diabetic signs and symptoms.

CLINICAL ASPECTS OF SHOCK

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The difficulties which beset the study of shock in wartime are obvious. Casualties, when they occur, are apt to be in overwhelming numbers, and the available clinical staff to deal with the cases is so overworked with urgent therapeutic procedures that adequate recording and study may be impossible. For this reason clinical data on shock are infinitely more scanty than reports on animal experimentation. In this school and hospital some 200 wounded patients were admitted during the London air raid period; of these, 28 had injuries of such severity as to require blood transfusion. In spite of considerable reduction of staff, circumstances were thus reasonably favorable for simple clinical observations and records to be made. It is on the basis of this experience that the opinions expressed in this paper are put forward.

When the present conflict began, views generally held of the nature of traumatic shock were those which had been reached at the end of the last war, with certain important modifications of outlook established by such experimental investigators as Blalock.¹ A fundamental feature of wound shock was taken to be a depleted circulating blood volume (oligemia). The investigators of the last war had made something of a mystery of the loss of blood, but since then the experimentalists had realized that probably the major part was lost by hemorrhage and exudation into the injured tissues.

CLASSIFICATION

Any attempt to produce a complete clinical classification of shock can be only provisional, as it is not yet possible to include all the complex factors involved. Blalock's classification into hematogenic, cardiogenic,

10. Cutuly, E.: Effects of Lactogenic and Gonadotropic Hormones on Hypophysectomized Pregnant Rats, *Endocrinology* **31**: 13, 1942. Teel, M.: The Effects of Injecting Anterior Hypophyseal Fluid on the Course of Gestation in the Rat, *Am. J. Physiol.* **79**: 170, 1926. D'Amour, F. C., and D'Amour, M. C.: Studies in the Action of Estrin in Pregnancy, *ibid.* **105**: 26, 1933.

The author's colleagues, particularly Drs. Bywaters and Sharpey-Schafer, have made continued efforts to work out these problems. Professor Grey-Turner and the surgical staff gave valued cooperation, without which the recorded observations could not be made.

1. Blalock, Alfred: Experimental Shock: Cause of Low Blood Pressure Produced by Muscle Injury, *Arch. Surg.* **20**: 959 (June) 1930; *Surg., Gynec. & Obst.* **58**: 551, 1934.

CASE 2 (by permission of the director of medical service, Royal Canadian Army Medical Corps).—A soldier during exercises was accidentally thrown from his motorcycle under a tank. Treatment in the hospital was begun within one hour. His injuries consisted of a compound fracture of the humerus, fractures of the ninth, tenth and eleventh ribs and also of the second, third and fourth lumbar transverse processes, a ruptured right kidney, a simple fracture of the right ankle, together with concussion and scalp lacerations. His blood pressure remained unrecordable until 2 liters of plasma and blood had been given: 3.5 liters brought his blood pressure to 100 mm. of mercury at the end of two hours. At the end of four hours, when 5.5 liters of blood and plasma had been given, he was fit for operation. His wounds were excised, the fractures were reduced and the abdomen was opened to make sure of the absence of intraperitoneal hemorrhage. A large retroperitoneal hematoma was present, which was left alone. During the operation a further liter of blood was given. The patient made an excellent recovery and was up in the ward in ten days.

It is unnecessary to seek any cause for the collapse in these cases other than the hemorrhage, which is quantitatively adequate to account for the clinical state, quantitative replacement in each case being followed by a satisfactory outcome.

Circulatory Collapse Due to Plasma Loss.—As I have already stated, circulatory collapse due to plasma loss is a rare occurrence except in burns and crushing injuries. As a result of tissue trauma in these cases the "permeability" of the capillaries is altered and a fluid closely resembling plasma leaks out into the tissues. In some of our cases of crushing injury the hemoglobin rose as high as 140 to 160 per cent. The shock which resulted is not of a special type, since the fall in blood pressure was fully accounted for by fluid loss. The blood pressure was invariably restored to normal by redilution of the blood to a more normal hemoglobin level by plasma or serum transfusions. The fall in blood pressure in these cases, however, was very profound.

Although the circulatory effects of crushing injuries are relatively simple in their essential features, the more important sequela of this type of trauma is renal failure. This syndrome, which is now usually called the "crush syndrome," has been fully described elsewhere.¹² Various products from necrotic muscle (myohemoglobin, potassium phosphate and other substances) leak out into the circulation when this is reestablished locally following release from the compressing injury, and severe renal impairment with death in uremia follows in 66 per cent of the cases.

II. HEMODYNAMIC SEQUELAE OF OLIGEMIA

The sequence of events postulated by the physiologic principles that have been outlined has been generally substantiated. There are, however, some important modifications requiring emphasis:

(a) *Hypertensive Reactions.*—In a small proportion of wounded subjects, probably about 5 per cent, the blood pressure may be found to be raised on first examination. This reaction was noted by Grant and Reeves in their survey, and we also observed it in this hospital in 3 of our 28 cases of shock. The injuries sustained by these patients have often been severe: they look pallid and the radial pulse at the wrist may be of small volume. When the blood pressure is taken, however, the observer is surprised to find that it is raised to 150 or 160 mm. of mercury. Such observations are of importance, as it is known that these patients may subsequently pass into the more typical picture of

oligemic collapse. Thus they must be very carefully watched in the hours succeeding admission. We have no satisfactory observations which throw light on the nature of this reaction, and it is mere speculation to suggest that the blood flow through the kidneys might be reduced and the hypertensive reaction results from the liberation of renin into the circulation.

(b) *Hypotensive Reactions.*—Generally speaking, blood losses up to a liter are well tolerated by normal persons, as far as can be gaged by blood pressure records. As long as such patients remain recumbent the signs of shock are not clinically obvious, apart from slight acceleration of the pulse (e. g. 60 to 80) and reduction of blood pressure by about 10 mm. of mercury. By the method of Cournand and Ranges¹³ Dr. Sharpey-Shafer and I made further observations on a human volunteer on cardiac output and right auricular pressure in hemorrhage. During hemorrhage (900 cc.) when the blood pressure remained within normal limits, though falling slightly, the pressure in the right auricle was falling steadily (by 6 cm. saline). Along with this there was a parallel fall in the output of the heart to two-thirds the normal level (from 4.85 to 3.2 liters per minute). The blood pressure is thus maintained only by a considerably increased peripheral resistance. During this stage of hemorrhage it is to be noted not only that there is a considerable reduction of the volume of blood in the systemic venous system (low venous pressure) but that there is also evidence of a reduction of the volume of the pulmonary vascular bed.¹⁴ Further observations of this type are still required in profound posthemorrhagic collapse.

Vasovagal Collapse (?carotid sinus syncope).—It was frequently noted in the blood transfusion depots that blood donors might faint during the withdrawal of the usual 380 to 540 cc. of blood.¹⁵ At first it was thought that this type of faint might be emotional, due to fear, the sight of blood or the like. Wallace and Sharpey-Shafer, however, showed that, when collapse occurred owing to the loss of 1,000 to 1,200 cc. of blood, it was usually of this vasovagal type in which the fall of blood pressure is accompanied by a pronounced slowing of the heart rate. In the course of the observation mentioned in the preceding paragraph a vasovagal faint occurred after blood loss of 900 cc. The blood pressure fell from 110 to 58 and the pulse from 82 to 50. During the faint the right auricular pressure rose by 2 cm. from the low level reached at the end of the hemorrhage. The cardiac output also rose slightly (3.2 to 3.6 liters per minute). Subsequent intramuscular injection of 30 mg. of N. methyl amphetamine¹⁶ restored the blood pressure from 60 to 135 mm. of mercury in eight minutes with little significant change in right auricular pressure or pulse rate, but the cardiac output rose from 3.6 to 4.8 liters per minute. Analysis of these data shows that vasovagal collapse is due to a sudden loss of peripheral resistance (presumably arteriolar tone) and, since there is an accompanying slowing of the pulse, there may be reason for suggesting that it is due to a hyperactive carotid sinus reflex. This speculation suggests that the threshold of sensitivity of the whole carotid sinus reflex mechanism is altered so that the sinus becomes sensitive to normal pressure, responding to it as though the pressure were raised. Professor

13. Cournand, A., and Ranges, H. A.: Proc. Soc. Exper. Biol. & Med. 46: 462, 1941.

14. Glaser, E. M., and McMichael, J.: Lancet 2: 230, 1940.

15. Greenbury, C. L.: Brit. M. J. 1: 253, 1942.

16. Supplied to us for testing by Burroughs Wellcome & Co. under the trade name of "Methedrine."

R. J. S. McDowall¹⁷ has demonstrated an increased sensitivity of the carotid sinus reflexes after hemorrhage in animals. He believes that the sensitivity of the carotid sinus mechanism is disturbed by reduction of pressure in the great veins near the heart.

It is important to recognize that vasovagal collapse with a slow pulse can occur as a sequela of considerable hemorrhage as well as of small blood loss. The condition may recover spontaneously in the recumbent position and, as I have indicated, it is in this type of collapse that N. methyl amphetamine may prove of greatest value by its vasoconstrictor action.

The Relation of Blood Volume to Blood Pressure.—Apart from the occurrence of a vasovagal type of collapse, acute blood loss up to a liter may be well tolerated so far as blood pressure readings are concerned. With larger losses data regarding blood volume change are more scanty and the methods less certain. Kekwick and his collaborators considered that the blood volume might often be reduced as low as 2 liters in cases of severe shock. We have estimated blood volume in various ways¹⁸ and we have also estimated blood loss in certain cases of gross hemorrhage, e. g. by estimating blood lost in the peritoneal cavity in a case of traumatic rupture of the liver. We believe that when shock is profound (systolic blood pressure lowered to 60 mm. of mercury or less) the circulating blood volume has often been reduced to 2 liters or below. This opinion is substantiated by the quantities of blood or plasma required to bring the blood pressure back to normal. This relationship of blood volume and blood pressure in hemorrhagic shock differs considerably from the concept put forward by Keith that shock was profound when the blood volume was reduced to 60 per cent of normal. This is of importance in giving us a clear idea of the volumes of blood, serum or plasma which have to be transfused in order to restore the blood pressure in wounded patients.

Recent work by McMichael, Sharpey-Schafer, Mollison and Vaughan¹⁹ seems to show that chronic reductions of blood volume (severe anemias) to the level of 2 liters are not uncommon without vascular hypotension. If our views are correct, the possibility of searching for a pharmacologic remedy for shock must again be considered possible. It is probable that such a drug will prove to be a venoconstrictor substance, reducing the peripheral capacity of the small veins and thereby maintaining the pressure near the right side of the heart.

Pulse Rate.—The conception of an increasing pulse rate running inversely to the fall in blood pressure and cardiac output has required modification. The conflicting mechanisms in the blood pressure response to hemorrhage already emphasized may possibly account for certain anomalies of pulse behavior. Sometimes the pulse is rapid but it is seldom above 120 per minute, while at other times it is slow in the presence of a low blood pressure, e. g. 80 per minute. Chart 2 gives a record of case 3, indicating the anomalous reactions which may be encountered in treatment. A boy aged 12 years had one kidney ruptured by a lorry wheel three hours before infusion was begun. Collapse was profound and the pulse at first unrecordable. The improvement due to the first transfusions of blood and serum was not maintained, and shock again increased

parallel with concentration of the blood. Two doses of four times concentrated serum caused improvement, which was maintained. There was dilution of the blood, and the blood pressure rose. Note the increasing pulse rate during and after recovery of blood pressure.

The moral is that pulse rate is far less reliable than blood pressure in serving as a guide for estimating either the severity of a given case of shock or the results of treatment.

III. TREATMENT

The classic lines of therapy include rest in the recumbent position, warmth and morphine. With the first there can be no argument.

The application of warmth, however, has come in for some criticism. It is generally known that the warm skin may accommodate up to half a liter of blood, and when the vital organs are suffering from a depleted circulation it seems unwise to deflect this valuable fluid into the temperature regulating vessels of the surface. Considerable support for the idea that heat may be harmful comes from the work of Blalock and Mason,²⁰ who showed a very significant decrease in the survival

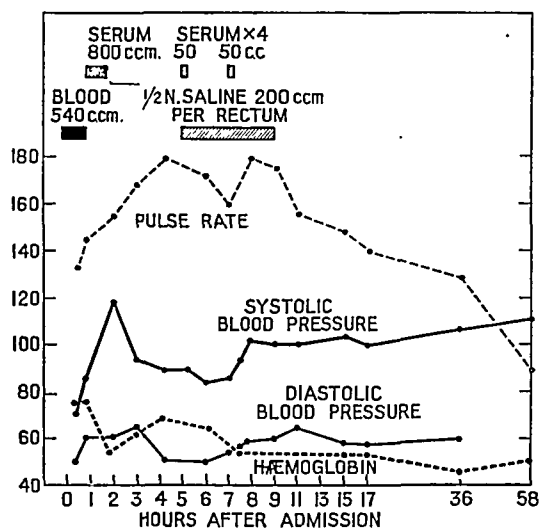


Chart 2.—Record in case 3. Note the increasing rapidity of the pulse with recovery. Total volume of transfusion equal to 60 per cent of blood volume in a boy weighing 60 pounds (27 Kg.). (By permission of the Lancet.)

period of dogs which were heated after the induction of hemorrhagic shock. It seems possible from some of our records that overheating may have been harmful. The patient illustrated in chart 1 was heated between 10 and 11 p. m., and it was during this time that he developed a fall in blood pressure. It is felt, however, that much more work is needed on the influence of cold and heat before heating appliances should be completely forbidden. We take it as accepted, however, that excessive heating is now regarded as harmful and that we should limit our measures to the application of enough warmth for comfort until we know more.

Morphine is in no sense a remedy for shock. Shocked patients do not usually complain of pain, and there is little need to give them morphine unless they do. We frequently observed that the injured patients became restless and began to complain of the pain of their wounds when the blood pressure was recovering. Morphine could then be given, if necessary intravenously, by injecting into the infusion tubing, in the usual dosage.

17. McDowall: Personal communication to the author.
18. Bushby, S. R. M.; Kekwick, Alan, and Whitby, L. E. H.: *Lancet* 2: 540 (Nov. 2) 1940. Hill, D. K., *ibid.* 1: 177 (Feb. 8), 335 (March 15) 1941.
19. McMichael, J.; Sharpey-Schafer, E. P.; Mollison, P. L., and Vaughan, J.: *Lancet* 1: 637, 1943.

20. Blalock, Alfred, and Mason, M. F.: Comparison of Effects of Heat and Those of Cold in Prevention and Treatment of Shock, *Arch. Surg.* 42: 1054 (June) 1941.

Transfusion, however, is the sheet anchor of treatment. Blood is the fluid of choice, but serum or plasma may be used equally well so long as excessive hemodilution is not produced. It was our practice to begin all urgent cases with serum, as this saved time in typing and cross matching which could be done later. There is no need to discuss the indications for transfusion in the cases of severe collapse. If the blood pressure is decidedly reduced, transfusion should be begun without hesitation. A critical level, however, is difficult to define; we have had experience of cases with blood pressures reduced to 80 to 90 mm. of mercury by hemorrhage. When left at this level for more than an hour or two, an irreversible and fatal collapse developed. It should be noted that there are other types of collapse in which blood pressures below 80 are well tolerated for long periods, e. g. coronary thrombosis. None the less I believe that, if the blood pressure does not show signs of recovering spontaneously from pressures below 90 at the end of one hour, transfusion should be begun without further delay.

The volume of fluid to be given can be estimated only by the blood pressure response. Transfusion must be continued until the blood pressure has been restored to what can be regarded as a normal level. Up to this

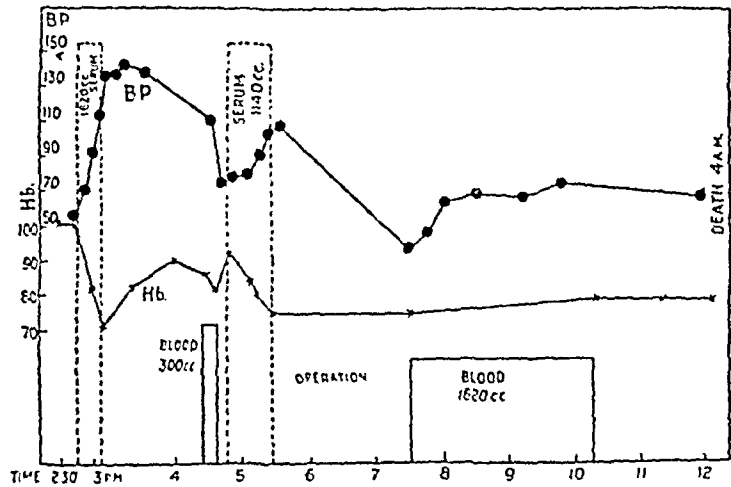


Chart 3.—Record in case 4. Note progressive decrease in blood pressure response to equivalent transfusions until an irreversible state is reached with no recovery. Optimum time for operation should have been after the first transfusion. (by permission of the Edinburgh Medical Journal.)

point it may be given as quickly as fluid will run into the veins; thereafter it should be slowed to a drip, the drip being maintained until the end of any necessary operation.

Other Measures in Treatment.—Oxygen therapy by the efficient B. L. B. mask was considered but had to be held in reserve. In our experience it was not found practical to do all that had to be done for a severely injured patient (make frequent blood pressure recordings, carry out the necessary examination, take the history, maintain a blood transfusion and so on) and give oxygen at the same time. Recent work suggests that oxygen therapy has only a limited value.²¹

Drug Treatment.—Vasoconstrictor drugs have so far not been considered to have any place in the treatment of shock. The administration of such substances was thought to be contraindicated, as vasoconstriction is a prominent feature of most cases of oligemic collapse. The most recent reports on N. methyl amphetamine²² indicate that, while it may be of value in postoperative states, it is none the less essentially an arteriolar constrictor and as such has little place in the treatment of

oligemic collapse. Where oligemia is complicated by a loss of arteriolar tone, as in the vasovagal cases or after anesthesia, it has already been shown to be of considerable value. I feel that there is an undoubted place for a substance which will diminish the capacity of the small venules in the periphery, as this mechanism is probably responsible for maintaining blood pressure in cases of severe anemia in which the blood volume is reduced.

IV. THERAPEUTIC FAILURES AND ANOMALOUS CASES

The early and adequate application of the foregoing therapeutic measures will be successful in the majority of wounded subjects. In a certain number, however, the treatment may fail, and the causes of this failure require analysis. In our own material in this hospital during the London air raids therapeutic failures were mostly accounted for when full postmortem analysis was made. Among the factors responsible are the following:

1. Continued hemorrhage and visceral injuries. In order to avoid this complicating factor an early and adequate review and assessment of the patient's injuries is necessary. In 1 of our cases a ruptured spleen had not been diagnosed clinically, while in another multiple rib fractures were associated with pleural and pericardial hemorrhage with cardiac tamponade.

2. Pulmonary fat embolism. This is another factor which may cause or increase the degree of collapse.

3. Superadded bacterial infection. This may result in (?) vasomotor paralysis from bacterial toxemia. This may play a part in the production of collapse in abdominal injuries, particularly those associated with perforation of the large intestine.

4. Preexisting disease. In raids on the civil population all ages are likely to be involved, and old age, for example, may change the picture considerably. In 1 middle aged patient a coronary thrombosis developed during a period of low blood pressure due to oligemic shock. Cardiac failure developed during the attempts which were made to increase the blood pressure by transfusion, but the patient ultimately made a good recovery.

5. Carbon monoxide poisoning. It should always be kept in mind that explosions in big cities may lead to the rupture of gas mains and that explosive gases by themselves in confined spaces may produce carbon monoxide poisoning. Several cases of this type were admitted to this hospital during the London air raid period. The blood pressure may be low on admission, and the case may be mistaken for one of wound shock.²³ Sir Cuthbert Wallace²⁴ reported a case which was probably of this type in the last war and which has been frequently quoted to emphasize the mysterious nature of shock. "One [person] was buried by the explosion of a shell in a cellar. He exhibited all the classic symptoms of shock, which lasted over forty-eight hours. . . . Treatment was of no avail." The post-mortem examination did not show any gross lesion. We feel in retrospect that this case was probably one of carbon monoxide poisoning.

6. The irreversible state. It is now well recognized that if the blood pressure is reduced too low for too long as the result of hemorrhage, replacement of all the

21. Frank, H. A., and Fine, J.: *J. Clin. Investigation* 22: 305, 1943.
22. Dodd, H., and Prescott, F.: *Brit. M. J.* 1: 345, 1943.

23. McMichael, J., and Ruskin, H. D.: *Lancet* 2: 677, 1941.
24. Wallace, Cuthbert: M. R. C. Reports of Special Investigation Committee on Surgical Shock and Allied Conditions: VIII. Traumatic Toxemia as a Factor in Shock, Medical Research Committee, Special Report Series, No. 26, London, His Majesty's Stationery Office, 1919.

blood which has been lost will not be followed by recovery. Chart 3 illustrates the development of the irreversible state in a patient who was treated for profound collapse following a bomb injury.

CASE 4.—A woman aged 56 was admitted after severe crushing injuries involving a compound fracture of the left leg; 1,600 cc. of serum was given, and the blood pressure rose to 140/90, with a fall of hemoglobin from 102 per cent to 72 per cent. An hour and a half later the hemoglobin had risen to 90 per cent again, which meant that the serum given had been almost completely lost from the circulation and the blood pressure had collapsed to 75 mm. of mercury. After further transfusion the patient was operated on, the wounds being excised and the leg put up in plaster. It was found that the skin of the leg had been torn from the underlying fascia and a large pool of blood had formed, containing several pints. In spite of further postoperative transfusion this patient died.

It is to be noted that the response to transfusion of equivalent quantities of blood on three successive occasions in this patient became progressively less. The final irreversible state which was reached after the operation was accompanied by considerable spasm of the veins, which made transfusion of the blood slow and difficult. This venospasm is not infrequently encountered in severe collapse; and it may be impossible to force blood into the veins even under pressure.

The nature of this irreversible state is not yet understood. It would be valuable if experimental investigators could concentrate on an analysis of this phenomenon. Wiggers and Werle²⁵ believe that it is due to a central cardiac failure resulting from prolonged coronary ischemia. Further electrocardiographic studies might be helpful in clearing up this point. It seems that under battle conditions this irreversible state may constitute the major problem of shock owing to the unavoidable delays in getting the patients back to base hospitals. The problem is therefore both urgent and practical.

V. THE ORGANIZATION OF RESUSCITATION TEAMS

It is obvious from the foregoing that the management of the severely injured patient requires as continuous and assiduous attention as the care of diabetic coma. Under the conditions in which these casualties occur, the technical skill of the surgeon and his assistants had to be fully utilized in the operating theater. It is therefore important that physicians trained in transfusion technics should cooperate with the surgeons in charge of special resuscitation wards. The patients who are admitted in batches are reviewed quickly by the surgeon and physician together; throughout their care the surgeon remains in charge, but it was our practice to leave the decisions regarding the urgency of operation and modifications of the order of priority in the operating theater to the physician. He had the assistance of the surgeon between operations when decisions were difficult. Repeated blood pressure observations are necessary in the control of these patients, and in civil hospitals the help of students was of great value. Under military conditions it may be that orderlies and nurses should be trained in the recording of blood pressures. If possible one nurse or orderly should be allocated to each patient, or at most 2 patients, requiring transfusion. This means a considerable expansion of the ordinary estimate of nursing requirements. It was only when these points were realized that we achieved greater success in our treatment of shocked patients.

Throughout the foregoing description I have emphasized the part which may be played by the physician

in charge of resuscitation work. It must never be forgotten, however, that the patients have injuries requiring surgical attention, and shock cannot be treated without careful dovetailing of the medical measures of resuscitation to the necessary surgical interventions. Even patients with their blood pressures restored to normal may deteriorate by failure to operate at the opportune moment. Generally speaking, the longer operation is delayed, the worse for the patient, and when shocked patients happen to be admitted singly there is a good deal to be said for carrying out resuscitation measures in the operating theater just prior to and during operation. Delay in operation leads to such complications as infection, further hemorrhage and the development of the irreversible state.

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PES PLANUS

MILITARY SIGNIFICANCE AND TREATMENT WITH SIMPLE ARCH SUPPORT

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Prior to the declaration of war, the degree of pes planus was of prime importance in determining the pedal physical qualifications for military service. Regulations of both the Army and the Navy were definite regarding the type of foot acceptable, and persons with pronounced or third degree pronation were eligible for discharge or disqualification without consideration of the clinical symptoms.¹

In many instances deserving men were denied admission into the service, and, perhaps in too many cases, men were discharged because their feet appeared to be "flat." Approximately 50 per cent of the patients examined by the Certificate of Disability Discharge board at the Station Hospital, Camp Callan, California, appeared for orthopedic complaints, and of these one third were for foot complaints. Those discharged from the Army for foot symptoms constituted 40 per cent of the total receiving a medical discharge for the period from March 8 to June 1, 1941 and 28 per cent of the total from June 1 to Oct. 1, 1941.

Since December 7, 1941 a firmer attitude in regard to pes planus has been assumed by the Selective Service and Certificate of Disability Discharge examining boards. Only 2.6 per cent (13 cases) were discharged by the Certificate of Disability Discharge board for pes planus during the year 1942, and 7.3 per cent (67 cases) were reclassified for limited service. But foot complaints continue to be a major military problem, as shown by the report of Berkman,² who states that 40 per cent of the complaints in the orthopedic clinic at Camp Lee, Virginia, are referable to the foot.

Studies undertaken at the Station Hospital, Camp Callan, California, during the fall of 1941 justify this change in policy. Complete histories of the men and examinations of their feet (table 1) were recorded on 75 white soldiers who were admitted to the orthopedic service with foot complaints and subsequently discharged from the service in accordance with existing army regulations. These results were compared with the findings obtained on examination of 347 white soldiers with no subjective symptoms. In addition, foot prints

1. Medical Department: Standard of Physical Examination for Entrance into the Regular Army, National Guard and Organized Reserves, Army Regulations 40-105, United States War Department, section XIX, paragraph ab; also MR 1-9, CI, paragraph 46 j.

2. Berkman, E. F.: Etiological Possibilities of March Fractures, J. Bone & Joint Surg. 25: 206 (Jan.) 1943.

were made by blackening the soles with finger print ink and then obtaining an impression with full weight bearing (fig. 1). As is customary, the weight bearing line as tested by a plumb line was noted. A perpendicular to the line connecting the first metatarsal head and os calcis gave the measure of pronation.

Table 2 shows that the majority of the men receiving discharges had a so-called third degree pes planus. It is significant to note that 7 (2 per cent) of the normal group also had third degree pronation and that 52 (15 per cent) had moderate or second degree pronation. It follows, therefore, that pronounced pronation may be present without symptoms. In fact, one of the most severe cases of pes planus noted in this series was that of a soldier who had been able to march 20 or more miles daily with full pack and no complaints. These findings substantiate Lewin's³ statement that "the height of your arch does not determine the strength or usefulness of your foot." Quite often cases of pes cavus, that is, those with pronounced elevation of the longitudinal arch, give considerable pain, especially over the metatarsal heads. "A flat foot may give a good performance, whereas a high-arched foot may be incompetent."³

TABLE 1.—Pes Planus Survey

Name:	.....	
Age:	.....	
Service No.:	.....	
Station:	.....	
Home Address:	.....	
Occupation:	.....	
Steady	.....	Intermittent	.....
Site of pain:	.....	.....	.....
Sharp	.....	Dull	.....
Duration	.....	Constant	.....
Intermittent	.....	.....	.....
Worn arch supports before	.....	.....	.....
Backache	.....	.....	.....
Fatigue	.....	Pain in knees	.....
Metatarsalgia	.....	.....	.....
Other symptoms:	.....	.....	.....
Length of Army service:	.....	No. of hikes	.....
Length	.....	.....	.....
Ability to drill:	.....	.....	.....
Other symptoms:	.....	.....	.....
Examination: Degree of pronation	.....	Right	.....
Left	.....	.....	.....
Rotation of os calcis	.....	.....	.....
Callosities	.....	.....	.....
Corns	.....	.....	.....
Hammer toes	.....	.....	.....
Weight	.....	Height	.....
Diagnosis:	.....	.....	.....
Treatment:	.....	.....	.....
Disposition:	.....	.....	.....

The symptoms of foot strain from pes planus are subjective. However, several factors in the patient's history are helpful in evaluating these symptoms. For example, of the 75 discharged, 48 (64 per cent) gave a history of previously using supports; an association of backache was noted in 46 cases (61 per cent) and pain in the knees in 54 (72 per cent). Only 1 patient was overweight, although the weight and height were carefully checked in each instance. No significant difference was noted in the relationship of former occupation, whether sedentary or active (table 3). The age limits in the two groups were comparable.

Efforts to relieve symptoms with "Thomas heel," a combination of heel and sole elevations, or "Jones metatarsal bars," were usually unsatisfactory. Long and frequent marches soon render these elevations of the shoe ineffective, whereas an arch support in the shoe is more durable. Moreover, arch supports can be changed from shoe to shoe and are easily raised or lowered. After various experiments I worked out a simple and practical arch support. It is effective in relieving symptoms in the majority of cases, easy to make, inexpensive and adjustable.

To make the support cut a piece of leather (fig. 2) about 7½ inches long, 4 inches wide at the instep, tapering down to about 2 inches at the heel and about 4 inches in the metatarsal region, depending on the size of the soldier's foot. The leather beveled on the lateral edge gives the effect of a Thomas heel. Adjacent to

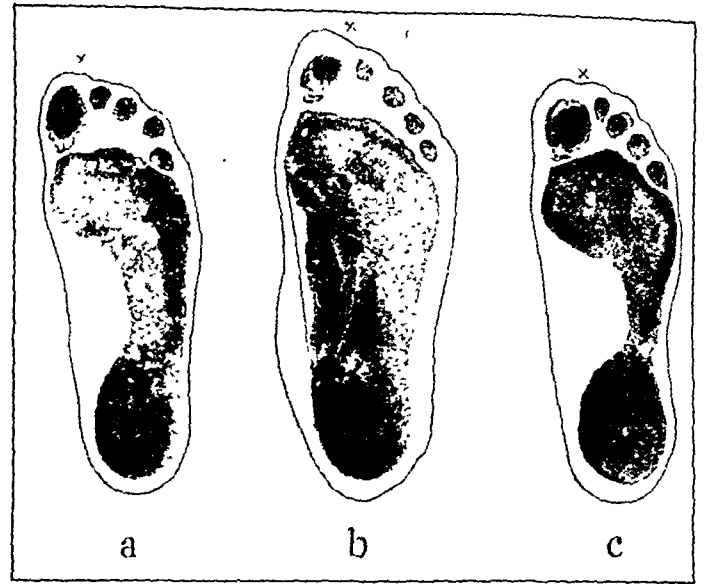


Fig. 1.—a, normal foot print; X marks the weight bearing line. b, third degree pes planus; note line connecting metatarsal head and os calcis, enabling measurement of degree of pronation. This type of foot may or may not be symptomatic. c, moderate pes cavus, more likely to cause symptoms than b.

the longitudinal arch the leather is skived to allow for molding. The front of the support may be beveled for comfort. Soak the leather for several hours in water and then fasten onto a stock plaster with gauze bandage and allow to dry overnight into the shape of the plaster model. The plaster cast can be cut, deepening the longitudinal and metatarsal arches as indicated. Shape a pad of orthopedic felt, ordinarily used for padding plaster casts, to give support under the longitudinal arch and, if needed, under the metatarsal arch. Fasten this pad with glue to the leather. The support can be raised

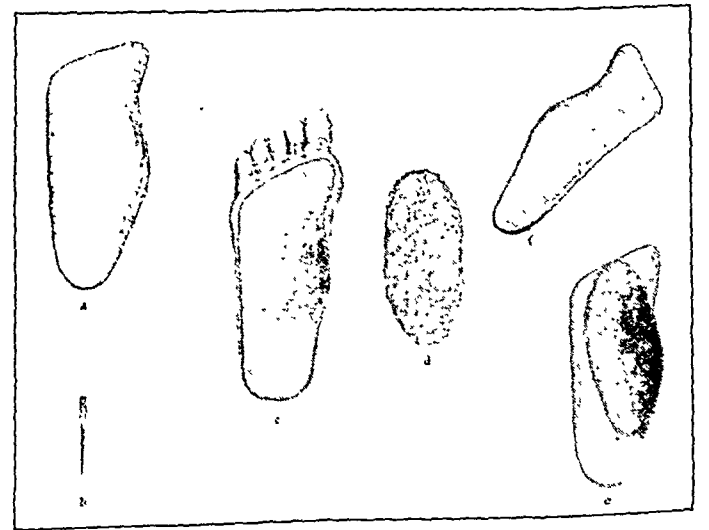


Fig. 2.—a and b indicate shape of leather with skiving on the lateral side giving the effect of a Thomas heel. c, wet leather bandaged onto plaster model and left to dry overnight. d, felt pad is shaped by emery wheel or razor blade to afford support under longitudinal and metatarsal arches. e and f illustrate completed arch support.

or lowered by the addition to, or cutting away of, the felt pad. If the felt pad packs down to where the support is too low, it may be raised by adding more felt. Several different sizes of molds are made—large, medium and small—in order that supports may be fitted

3. Lewin, Philip: The Foot and Ankle, Philadelphia, Lea & Febiger, 1941.

to the patient on his first visit to the clinic. Approximately 2 to 3 hundred pairs per month have been prescribed in the orthopedic clinic at Camp Callen, California. These arch supports cost about 20 cents a pair and are light and flexible.

Of course no orthopedic aid can be effective without a proper fitting shoe. Length of the sole should allow a thumb's breadth from the great toe to the end of the shoe with full weight bearing, preferably tested with the soldier carrying a pack (50 to 70 pounds). In many instances shoes provided have been too short. For determining the width of the shoe the forefinger should be able to be inserted between the great toe and the tongue of the shoe³ or by determining the amount of stretch of the leather at the level of the metatarsal heads. A shoe in the latter test that is too wide will allow a crease and if too narrow will present no elasticity.

Common aids in foot hygiene include the lacing of shoes loosely at the bottom, snug in the middle and loose at the top. This affords support to the longitudinal arch. Top holes do not need to be laced. Use of government issue foot powder, massage, manipulation, contrast baths, exercises, wearing two pairs of socks and cutting toenails straight across are helpful in relieving and preventing foot symptoms.

TABLE 2.—Degree of Pronation

	Number	Pes Cavus	No Pronation or Very Slight	Moderate or 2d Degree	Pronounced or 3d Degree
Symptomatic group receiving medical discharge.....	75	3	0	32	40
Nonsymptomatic group.....	347	0	288	52	7

TABLE 3.—Occupation

	Number	Occupation		Under 20	Age 20-30	Over 30
		Sedentary	Active			
Symptomatic group....	75	27 (36%)	47 (62%)	2	67	5
Nonsymptomatic group	141	62 (44%)	79 (56%)	2	106	33

SUMMARY

1. Foot complaints constitute one of the major problems in military medicine.

2. Pronounced pronation of the foot may be present without symptoms. Two per cent of a series of "normal" functioning feet presented third degree pronation and 15 per cent second degree pronation.

3. A light, flexible, adjustable leather arch support can be easily made in any army hospital.

Intelligence.—Education generally acknowledges that ability to act intelligently depends on native endowment, growth and opportunity for experiences of educational potentialities. Intelligence does not remain static. Improvement in environment will bring about a gain in intelligence. In the ultimate outcome, inherent capacities make more contributions than environment. "Some authorities claim that from 75 to 80 per cent of the intelligence quotient variance is due to innate and heritable causes while about 17 per cent is due to difference in home environment and that home environment in rare, extreme cases may account for as much as twenty points of increment above the expective or congenital level." Bingham states: "The evidence at present in hand indicates that there is about one chance in twenty-two that during a four year period intelligence quotient will either increase or decrease as much as this, and that about one chance in three that it will change as much as six points."—Davis, John E.: *Principles and Practice of Rehabilitation*, New York, A. S. Barnes & Co., Inc., 1943.

PAINFUL FEET

CONGENITAL INSUFFICIENCY OF THE FIRST METATARSAL SEGMENT AS A CAUSE AMONG SOLDIERS RECENTLY INDUCTED INTO THE ARMY

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A surprisingly large number of soldiers who have been recently inducted into the Army develop the complaint of "painful feet" during the period of their basic training. Fortunately, most of these symptoms are due to minor functional strains from the physical conditioning program. These respond very well to the treatment of the battalion or dispensary surgeon with rest and conservative management. The more severe cases are referred to the Orthopedic Clinic, and in a large training camp hospital they can be divided into two groups: (1) traumatic lesions of the feet, severe strains, sprains and fractures, and (2) postural foot disorders and skeletal abnormalities. This second group generally requires the most careful diagnosis and prompt treatment if men thus affected are to be salvaged for some useful type of military service.

THE FIRST METATARSAL SEGMENT

A frequently unrecognized and undiagnosed cause of foot pain in the new soldier is a congenital insufficiency of function of the first metatarsal segment. Slightly over 10 per cent of all patients with foot disorders of the second class were found to have this pathologic condition during a six month observation period at the Orthopedic Section of the Surgical Service, Station Hospital, Camp Van Dorn, Mississippi. Its medical importance and military significance both lie in the fact that with correct early diagnosis and specifically designed treatment almost all these patients can continue on full field duty. This anatomic variation in the foot has been called "Morton's syndrome" for its discoverer, Dr. Dudley J. Morton,¹ professor of anatomy of the Columbia University College of Physicians and Surgeons, New York. His lifetime of study of the pathologic anatomy of foot disorders and his original methods of diagnosis and treatment are among the greatest contributions of this generation to our knowledge of the structure and functions of the feet. Other names given to conditions arising from this syndrome are "metatarsus primus brevis varus," "Morton's principle" and "short first metatarsal." In addition there are many types of foot abnormalities which some orthopedic surgeons believe originate in this syndrome—some of which are misnomers—"fallen metatarsal arches," "painful transverse arches," metatarsalgia, weak feet, low longitudinal arches, flat feet and pronated feet. Indeed, whenever one of the aforementioned diagnoses has been made in civilian life and the treatment received has been unsuccessful in relieving the symptoms, it has been a common occurrence on clinical examination to find a case of short or relaxed first metatarsal segment present which has been symptomatic but not previously recognized or adequately treated.

The syndrome of shortness of the first metatarsal segment should not be confused with the more rare

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1. Morton, Dudley J.: *The Human Foot*, New York, Columbia University Press, 1935; *Foot Disorders in General Practice*, J. A. M. A. 109: 1112-1119 (Oct. 2) 1937; *Functional Disorders of the Feet and Their Treatment*, New York State J. Med. 42: 2119-2123 (Nov. 15) 1942.

pathologic lesion known as "Morton's sore toe" or "Morton's metatarsalgia," which was first described by Professor T. G. Morton in 1876. Both conditions may be responsible for a clinical metatarsalgia, but in the latter condition the cause is considered to be a definite neuroma of one of the plantar nerves. In my experience the incidence of these cases is very small compared with the number of patients who have metatarsal pain from short first metatarsal segment, and I have not found it necessary to resort to surgery of the plantar nerves to effect a clinical cure.

The principal anatomic or functional insufficiency of the first metatarsal segment of the foot is the underlying cause for the production of the symptoms (fig. 1). This is due to a congenital developmental defect of the first metatarsal shaft, which may be either (1) shortened, so that it cannot bear its share of the weight thrust from the sole of the foot (fig. 2); (2) relaxed, so that it is dorsally hypermobile and can be displaced upward, causing a functional shortening (fig. 3); (3) abducted to a varus position out of the weight bearing

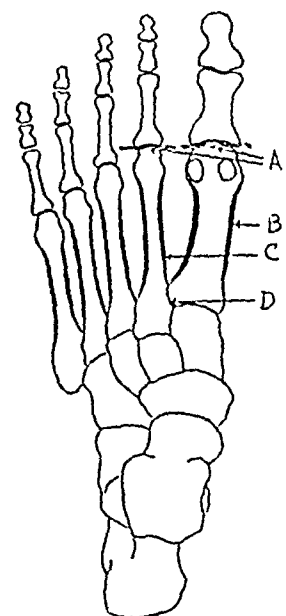


Fig. 1.—Diagram of the x-ray features of normal foot structure. A, first and second metatarsal shafts are equal in length; B, thicker cortex; C, thinner cortex; D, normal joint space.

line of the longitudinal arch (fig. 4); (4) functionally shortened by posteriorly displaced sesamoids, or (5) failing to bear a proper share of the weight of the body, owing to a combination of these deformities (fig. 5).

The condition is usually bilateral, and symptoms and changes in foot structure vary with the severity and the duration of the syndrome. The entire range of foot abnormalities which may result from this condition have been completely described and their cause determined in

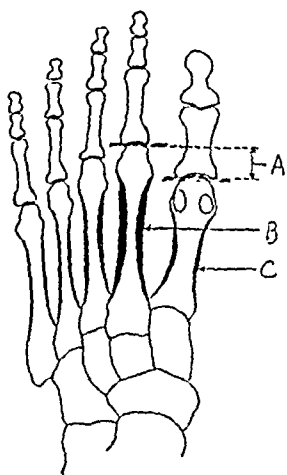


Figure 2.

Fig. 2.—Shortening of the first metatarsal shaft, with hypertrophy of the cortex of the second metatarsal shaft, the chief characteristic of Morton's syndrome, as diagrammed from typical x-ray findings. A, shortness of first metatarsal segment; B, thicker cortex of the second metatarsal shaft; C, thinner cortex of the first metatarsal shaft.

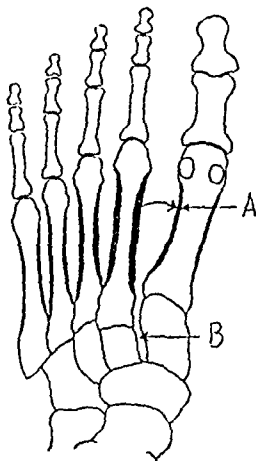


Figure 3.

Fig. 3.—Laxity of the first metatarsal shaft, resulting in widening of the joint space between the first and second cuneiforms. A, laxity of the first metatarsal shaft; B, widening of the joint space.

the publications of Dr. Morton, but a clinical study of a large number of these patients has not previously been published.

DIAGNOSIS

For clinical and practical purposes it is necessary to know only the primary and fundamental changes in foot structure and function which result from the instability of the first metatarsal segment. These are the following:

1. The second metatarsal segment bears an increased amount of the body weight, resulting in enlargement of the shaft, thickening of the cortex, painful pressure under the second metatarsal head and strain and aching in the midtarsal joints.

2. Callus formation develops under the distal head of the second metatarsal and to a less extent at the third and fourth.

3. There is a tendency of the foot to pronation, with lowering of the longitudinal arch.

SYMPTOMS

Aching and burning pain under the callus at the region of the second and third metatarsal heads was the most common presenting symptom in this series of patients. Many had pain and stiffness in the second and third metatarsophalangeal joints described as being "behind the toes," "under the front of the foot" and

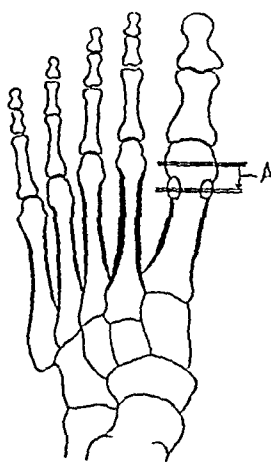


Figure 4.

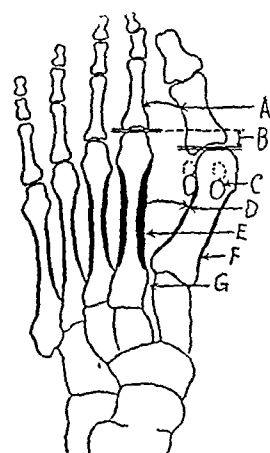


Figure 5.

Fig. 4.—Posterior displacement of the sesamoids, with resulting functional shortening of the first metatarsal segment and second metatarsal hypertrophy. A, displacement of the sesamoids posteriorly.

Fig. 5.—Combination of all three factors in a severe case of Morton's syndrome. A, hallux valgus; B, short first metatarsal shaft; C, displaced sesamoids; D, metatarsus varus; E, thickened cortex; F, thinner cortex; G, widened joint space and laxity of the joint.

"inside the middle of the foot." Longitudinal arch pain, swelling and redness at the midtarsal region and aching of the calf, hamstring and back muscles were quite frequent. These symptoms were characteristically functional and dynamic and were relieved completely by rest and aggravated by a long period of standing, marching or drilling. With the pain was frequently excessive foot fatigue.

DURATION OF SYMPTOMS

Acute symptoms were seldom of more than a few weeks duration, but most patients stated that their feet had "always been bad" or "too weak to do anything." In every instance close questioning revealed that the patients had been conscious of some foot weakness or abnormality in civilian life (E. P. T. E., existing prior to entrance into the Army). Some had tried arch supports or metatarsal pads without much benefit. But most of them found that their symptoms were being aggravated by their new and strenuous military duties

and were seeking medical consultation for the first time. This was particularly true of persons who followed sedentary occupations or trades while in civilian status.

PHYSICAL FINDINGS

On casual inspection many of these patients have feet that appear very nearly normal, and a careful physical examination is indicated to avoid the mistake of missing this syndrome and labeling the soldier a "gold brick." The symptoms are frequently quite pronounced in contrast to the few physical signs. For this reason an x-ray check is advisable in every case in which this pathologic condition is suspected.

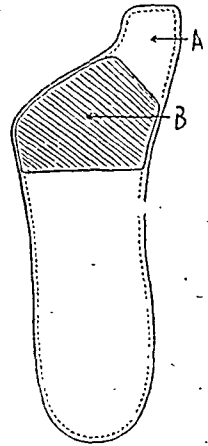


Fig. 6.—Diagram of a compensating insole. A, platform raised beneath the first metatarsal head; B, optional metatarsal pad or transverse bar.

The deficiency of the first metatarsal segment is determined by palpation of the first metatarsal shaft. It is shortened and may be slightly displaced upward and medially by pressure. With the sole of the patient's foot raised toward the examiner, he should palpate the metatarsal heads, pressing upward on the ball of the foot similar to the pressure incurred in standing. The heads of the second and usually the third metatarsals are found to be unusually prominent while the head of the first is depressed, short, abnormally moveable and covered with smooth, soft, non-weight bearing skin. This shortness, relaxation and hypermobility may be further exaggerated by a posterior displacement of the weight bearing sesamoid bones, which causes a further increase of symptoms. Sesamoiditis, however, is rare except in the extremely pronated foot.

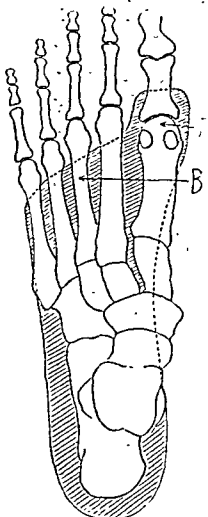


Fig. 7.—Compensating insole diagrammed in place to show support of the first metatarsal segment. A, platform under the first metatarsal head; B, cushioning behind the second, third, fourth and fifth metatarsal heads.

Callus formation may be localized in the middle of the forefoot or may be discrete and under separate metatarsal heads from the second to the fifth. In some instances the great toe becomes weight bearing and a hard callus is found under the medial aspect of the interphalangeal joint. A third less common site for callus is in the "bunion" position on the medial side of the distal head of the first metatarsal.

Acute symptoms are most often due to a traumatic synovitis of the second and third metatarsophalangeal joints and the middle cuneiform joints. There may also be spasm in the toe extensor muscles with temporary dorsiflexion of the toes and later contractures and claw toes resembling hammer toes.

Chronic symptoms come from secondary hypertrophic osteoarthritis. The usual sites are the first metatarsophalangeal joint, when the great toe has been plantar flexed for compensatory weight bearing, and the cuneiform joints. These joints may be enlarged and tender, but confirmation of this complication should be obtained by x-ray examination.

The inadequate support of the short and relaxed first metatarsal segment weakens the medial border of the longitudinal arch of the foot. This causes pronation, found in many of these cases, as the foot rolls inward and downward to secure some support from the first metatarsal shaft. Flattening of the longitudinal arch occurs gradually as the result of absence of support from the short and relaxed first metatarsal segment and stretching of the ligaments in the tarsal region.

Secondary symptoms of this syndrome are therefore similar to the symptoms of weak feet, pronated feet

TABLE 1.—Analysis of Cases

I. The incidence of patients with Morton's syndrome:			
Orthopedic patients seen in six months from a group of 10,000 soldiers in training.....			
Patients with "painful feet".....	332	3.32%	
Patients with Morton's syndrome.....	34	0.34%	
II. Typical findings in 100 patients with Morton's syndrome:			
1. Symptoms:			
Acute	18		
Subacute	46		
Chronic	36		
Metatarsalgia	90		
Callus under 2d and 3d metatarsal heads.....	76		
Longitudinal arch pains.....	62		
Excessive foot fatigue.....	72		
Muscular pain in legs.....	18		
Backache	12		
2. Duration of symptoms:			
a. Longest	17 years		
Shortest	1 week		
Average duration	2 years		
b. Age at which symptoms appeared:			
Earliest	11 years		
Oldest	38 years		
3. Physical findings:			
Short 1st metatarsal shaft.....	90		
Dorsal hypermobility	32		
1st metatarsus varus	18		
Displaced sesamoids	4		
4. Secondary findings:			
Pronated feet	16		
Pes planus	26		
Weak feet	18		
III. Treatment prescribed for 100 patients:			
1. Morton's compensating insoles.....	90		
2. Exercises for strengthening feet.....	18		
3. Hydrotherapy	14		
4. Duration of therapy:			
Treated in civilian life by other methods.....	24		
Symptoms but no treatment in civilian life.....	10		
First symptoms and treatment in Army.....	66		
Number treated as outpatients.....	96		
Number admitted to the hospital.....	4		
Average duration of treatment.....	8 days		
Minimum treatment	2 days		
Maximum treatment	21 days		

TABLE 2.—Results of Treatment

1. Soldiers returned to full military duty (general service).....	76
2. Soldiers reclassified for noncombatant duty (limited service).....	14
3. Patients under treatment or awaiting reclassification.....	10

and flat feet but are usually less severe and the physical findings less pronounced. Other foot abnormalities, pes cavus, club foot, congenital pes planus hallux valgus, bunion, hammer toe, contracted calf muscles and plantar warts were found associated with this syndrome occasionally but seem to have no etiologic relationship.

X-RAY FINDINGS

The most valuable and accurate means of confirming the diagnosis of Morton's syndrome is an antero-posterior film of the foot in the standing position centered over the second cuneiform bone (dorsoplantar x-ray view). The findings are pathognomonic regardless of the severity or mildness of the symptoms in the particular case (figs. 2, 3, 4 and 5). The first meta-

tarsal is shortened, compared to the second, and is very frequently in varus. The cortex is more thin than normal and may appear atrophic. Osteoarthritis of the first metatarsophalangeal joint is an occasional finding. The sesamoids may appear displaced posteriorly or adducted. A lateral view may show a relative dorsiflexion of the first metatarsal shaft. Relaxation is further evidenced by widening of the joint between the first and second metatarsals and the first and second cuneiforms. The second metatarsal shaft is hypertrophied and enlarged, the cortex is thickened and there is evidence of increased functional stress. The third and fourth metatarsal shafts may show similar changes to a less degree.

These x-ray findings verify the specific skeletal changes which occur as congenital abnormalities and as developmental functional lesions in this disorder and prove its pathologic entity. This fact, together with the specificity of its treatment, is sufficient that this condition should be classed and described as a separate syndrome in the terminology of foot conditions.

TREATMENT

The original and effective principle of treatment has been demonstrated by Dr. Morton to be the restoration of the weight bearing function and normal position of the first metatarsal segment of the foot. This is most simply done by placing a platform or support of the proper thickness under the sole of the foot beneath the distal head of the first metatarsal. The specific treatment compensates both for the shortness and for the relaxation of the first metatarsal segment, gives support to the medial side of the longitudinal arch and relieves the symptoms caused by excessive weight thrust on the second metatarsal and midtarsal region of the foot.

In its most practical form this treatment consists in prescribing a "compensating insole," which is fitted by shoe size and has a built-in platform which extends out under the head of the first metatarsal pad or bar. The platform at the base of the great toe can be raised or lowered as needed.

This device can be made from a suitable thickness of sole leather from a tracing of the patient's foot. This can be done by any shoemaker or a soldier with special training. A low cost commercial model is also available which has superior wearing qualities and a sponge rubber metatarsal bar and can be obtained on prescription of an orthopedic surgeon or medical officer.

After the insoles are supplied to the patient they are checked for fitting and the proper height of the platform. Then they are worn for an hour or more daily, the time being increased until they are comfortable and the symptoms from the disorder have disappeared. The patient transfers them from one pair of shoes to another in changing footwear, never going without them again for more than a few hours. A soldier accustomed to their use would no more go without them on a march than he would study without glasses if necessary for reading.

General treatment is emphasized for the first week or so for the relief of acute symptoms and to strengthen the foot muscles whenever necessary. Exercises, contrast and whirlpool baths, and periods of rest and elevation of the feet are used. If the soldier is being treated as an outpatient, a period of seven to ten days on "light or fatigue and kitchen police duty" is often recommended to his company commander.

The results of this treatment and a comparison of the findings in a group of 100 patients is shown in the tables.

SUMMARY

1. Ten per cent of the soldier patients in the Orthopedic Clinic of the Station Hospital at Camp Van Dorn, Mississippi, who complained of "painful feet" were found to have "Morton's syndrome," or congenital insufficiency of the first metatarsal segment.

2. This foot disorder is a clinical entity characterized by metatarsalgia and midtarsal pain caused by a congenital developmental shortening or relaxation of the first metatarsal segment of the foot.

3. Diagnosis can be made by physical examination and verified by x-ray films in every case. Treatment consists in supplying an individually fitted "compensating insole" which provides a weight bearing platform for the first metatarsal head.

4. Of 100 soldiers treated by this method, 76 have been able to continue full military duty, "general service," while wearing the "compensating insoles."

ACUTE PORPHYRIA

LIEUTENANT SAMUEL NESBITT
MC-V(S), U.S.N.R.

Acute porphyria is a disease which has been recognized for many years and which has received considerable attention in the literature but which has been neglected in medical teaching, so that it is totally unfamiliar to many or most physicians. I¹ have made the suggestion that this disease is not as unusual as was formerly supposed and that with a more general knowledge of the subject more cases will be detected. My purpose in the present communication is to review the clinical aspects of the disease and to present 3 additional cases of unusual interest occurring in the same family which have been encountered during the past year.

For a proper understanding of the disease, certain historical aspects of the problem are worth noting. In 1841 Scherer² described a red pigment formed by the action of strong sulfuric acid on hemoglobin. Although similar observations were made by Mulder,³ an adequate study of this substance was not undertaken until 1871, when Hoppe-Seyler described certain of its chemical and physical properties and named it hematoporphyrin. Baumstark⁴ aroused an interest in the part hematoporphyrin might play in medicine when he discovered similar pigments in the urine of a patient who had leprosy, and by 1892, when Garrod reviewed the subject,⁵ it had been demonstrated that "hematoporphyrin" occurred in the urine of healthy persons in small amounts and that larger amounts were present in the urine of patients who had a great variety of diseases. Günther⁶ described patients who excreted so much red pigment that the urine was colored, a condition which he was convinced constituted a clinical

Aided by a grant from the Fluid Research Fund of the Yale University School of Medicine.

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entity, which he believed to be caused by a constitutional anomaly of pigment metabolism and which he called hematoporphyrin. In 1924 Fischer⁷ demonstrated that patients with this disease excrete coproporphyrin and uroporphyrin but that they never excrete hematoporphyrin, which is a laboratory product and never occurs in nature. For this reason hematoporphyrin is a misnomer and the term porphyria is to be preferred to the use of either hematoporphyrin or hematoporphyrinuria, which terms are still occasionally encountered because of long usage. The term porphyrinuria should be reserved to indicate those instances in which the porphyrins occurring naturally in the urine are present in amounts above the normal range, a condition which exists in a great variety of diseases.

The porphyrias have been classified as congenital porphyria, acute porphyria and chronic porphyria. Congenital porphyria is a disease possibly inherited as a mendelian recessive which is characterized clinically by its appearance early in life or at birth, the excretion of large amounts of porphyrin, particularly uroporphyrin I, in the urine so that the color of the urine may be dark red at times, photosensitivity, predominance in males and discoloration of the teeth by impregnated uroporphyrin. It is an extremely chronic disease the outstanding feature of which is blistering, scar formation and eventual deformity of the exposed parts as a result of the light sensitivity. In 1938 Turner and Obermayer⁸ discussed 86 cases, 9 of which were considered doubtful. Acute porphyria differs fundamentally from congenital porphyria in that it is possibly inherited as a mendelian dominant, appears later in life, usually during the third and fourth decades, occurs in females more frequently than males, the ratio being about 3:1, photosensitivity is rare, pigmentation of the teeth is absent, uroporphyrin III is almost always predominant in the urine as a metal complex along with other pigments, and clinically the disease is first indicated by complaints referable to the abdomen or central nervous system. Acute porphyria has been further classified as acute toxic porphyria and acute idiopathic porphyria.⁹ It has been pointed out¹⁰ that the acute toxic forms and the acute idiopathic forms of porphyria are indistinguishable either clinically or by laboratory methods, the acute toxic form being recognized only on the basis of the presence of a toxic agent which apparently is an etiologic factor. Acute porphyria has also been classified¹¹ on the basis of the clinical picture as the classic type with abdominal and nervous manifestations, the abdominal type with abdominal colic only, the purely nervous type with central nervous manifestations without abdominal colic, the comatose type in which severe central nervous system involvement with coma is the outstanding event, and the latent type, which is asymptomatic despite the fact that the patient presents laboratory evidence of the fundamental pigment disorder. These are merely descriptive terms, and at different times a patient may fit into any one of these various type pictures. Up to 1939 over 250 cases of acute porphyria had been

reported.¹² A number of cases have been reported more recently.¹³ Chronic porphyria includes a group of cases characterized by a pronounced increase of porphyrin excretion and slight photosensitivity, as well as symptoms referable to the intestinal tract, which could not be classified as either congenital or acute porphyria. It is possible that these cases do not constitute a separate group but in reality represent either congenital or acute porphyria in mild form. The present communication will be restricted to a discussion of acute porphyria, and the reader is referred to more appropriate reviews concerning the other forms of porphyria.¹⁴

Acute porphyria is in reality a chronic condition¹⁵ characterized usually by exacerbations and remissions over a period of time ranging from months to as long a period as twenty-five years. A history suggestive of familial occurrence may often be obtained. In the past the patient may have suffered from time to time from any of an assortment of ill defined complaints including vague, poorly localized abdominal pain, bizarre pains in the extremities or elsewhere, nervousness, insomnia, depression and generalized or localized weakness; the urine occasionally may have been noted to be of an unusual dark or red color at times. It may be noted, perhaps because of these earlier complaints, that the patient has been taking certain medications, or he may have been otherwise exposed to certain toxic agents which include lead, acetanilid, nitrobenzol, sulfonal, trional, various barbiturates and perhaps sulfanilamide.¹⁶ The acute episode¹⁷ is characterized chiefly by gastrointestinal disturbances and involvement of the central nervous system. Commonly there is severe cramplike abdominal pain, which may be generalized or which may be confined to the lower abdomen or about the umbilicus. There is associated usually nausea, vomiting and constipation, which may amount to complete ileus. There may or may not be fever or leukocytosis. Roentgenographic examination may reveal dilatation of some segment of the gastrointestinal tract, usually the duodenum, terminal ileum or a segment of the colon.¹⁸ Jaundice may occur, and liver damage may be demonstrated by appropriate laboratory tests.¹ Involvement of the central nervous system may be manifested by symptoms ranging from paresthesias and pain in the extremities to paralysis, delirium with hallucinations of vision and hearing, epileptic seizures and coma.¹⁹ The classic type of neurologic involvement has been described as that of

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10. Nesbitt and Watkins.¹ Mason, Courville and Ziskind.³ Watson.²⁶

11. Waldenström, Jan: Studies on Porphyria, *Acta med. Scandinav.*, 1937, supp. 82, pp. 1-254.

an ascending, Landry's type of paralysis. Of 143 cases described by Waldenström,²⁰ 60 showed neurologic symptoms. In these instances most of the pareses were irregularly distributed, sometimes involving only a small muscle group, sometimes practically all the striated muscles of the body. There may be ptosis, facial palsy, diplopia, dysphonia, dysphagia and dysmimesis. Respiratory failure due to bulbar palsy is a frequent cause of death. The pareses may appear suddenly or over the course of weeks. Psychotic behavior, usually of a type called toxic psychosis or manic-depressive, may be a feature of the disease, which is usually accompanied by progressive paralysis. Menstrual disturbances, particularly amenorrhea, are frequently associated with the acute episode.²¹ Photosensitivity occurs rarely and is comparatively mild.¹ There is occasionally a diffuse or spotted pigmentation of the skin, but not of the mucosa, the nature of which is unknown. The cardiovascular system is frequently involved, and hypertension is often an integral part of the picture.²² Also transient electrocardiographic changes during the acute episode have been described consisting of an elevated ST segment in lead 1 and slurring of the ST segment in lead 3.

The diagnosis of acute porphyria depends on an evaluation of the clinical picture and must be confirmed by an examination of the urine. The diagnosis will be made only if it is borne in mind and considered as a possibility in any case of unusual abdominal complaints or symptoms referable to the central nervous system, especially when these occur together, or when associated with the excretion of abnormally colored urine. It has been considered necessary to demonstrate the presence of uroporphyrin in the urine of such patients in order to establish the diagnosis of acute porphyria.²³ Several such cases, however, have been described in which uroporphyrin was not excreted in the urine,²⁴ and Waldenström²⁰ has described such a patient who later, during a period of remission, did excrete uroporphyrin. For a discussion of the chemistry of the porphyrins the reader is referred to more appropriate reviews.²⁵ Almost always patients with acute porphyria excrete uroporphyrins III and I in the urine, with a great predominance of the type III isomer, although several cases have been reported²⁶ in which the type I isomer was predominant. It has been shown during recent years that much of the uroporphyrin may be excreted as the zinc metal complex,²⁷ and between the acute episodes that fraction which is present as the metal complex may be increased. It is important to note that the absorption bands of the zinc metal complex of uroporphyrin are almost identical with those of oxyhemoglobin; a reversion spectroscopy is necessary for precise wavelength measurement, and final differ-

entiation is facilitated by the fact that when a strong mineral acid is added the metal complex is broken up and the absorption bands of the complex are replaced promptly by those of uroporphyrin. The normally occurring coproporphyrin of the urine is usually increased above the normal range, although not always, and when so increased the isomeric type III again usually predominates. Coproporphyrin of both isomeric types I and III has been isolated from the feces,²⁸ but only recently has uroporphyrin been isolated from the feces of patients with acute porphyria.²⁹ It has been known that the urine of these patients may be perfectly normal in appearance and also that a substance is present in the urine which produces a positive Ehrlich's aldehyde reaction.³⁰ Waldenström and his associates³¹ have described a colorless chromogen substance in the urine of these patients which they have termed porphobilinogen, which gives a strong red color with Ehrlich's aldehyde reagent and which on standing or being acidified and heated is converted partly into a red pigment resembling urobilin, called porphobilin, and partly into uroporphyrin. Watson and Schwartz³² have devised a simple test for urinary porphobilinogen which they believe to be pathognomonic of porphyria. It is becoming evident that many pigments may be involved in this metabolic disorder. Pigments other than porphyrins may account for most or all of the dark color of the urine of these patients, which may range from colorless or normal yellow to red or black, depending on the relative amounts of the various pigments which it may contain. The chemical nature of most of these is little understood. Included among them are melanin,³³ skatole red,³⁴ indole, leucine, tyrosine and cystine³⁵ and urofuscine.³⁶

It is obvious that the differential diagnosis of acute porphyria involves many possibilities. Almost always the acute episode is characterized by severe abdominal pain, nausea and vomiting, and constipation which may amount to complete ileus; there may be fever and even leukocytosis as high as 20,000 cells per cubic millimeter of blood, or there may be menstrual disturbances, notably amenorrhea. The problem may therefore appear to be a surgical one, and it is not surprising to know that many such patients have been operated on with the mistaken diagnosis of such conditions as acute appendicitis, surgical ileus, cholecystitis, ectopic pregnancy and ovarian cyst.²² On examination, however, the abdomen is usually soft, and it is during these

20. Waldenström, Jan.: Neurologic Symptoms Caused by So-Called Acute Porphyria, *Acta psychiat. et neurol.* **14**: 375-379, 1939.

21. Correll, H. L.; Peters, B. J., and Murphy, F. D.: Porphyria: A Report of Two Cases, *Urol. & Cutan. Rev.* **46**: 341-343 (June) 1942.

22. Waldenström (footnotes 11 and 20).

23. Mason, Courville and Ziskind.³ Watson.⁴⁶ Waldenström.¹¹

24. Backer-Gründahl, N.: Porphyria Without Porphyrin, *Acta chir. Scand.* **76**: 227-248, 1935. Ravn, J.: Disturbances of Liver Function in Two Cases of Acute Porphyria, *Acta psychiat. et neurol.* **10**: 459-480, 1935. Schie.⁹

25. Waldenström, Jan.: Some Observations on Acute Porphyria and Other Conditions with a Change in the Excretion of Porphyrin, *Acta med. Scand.* **83**: 281-316, 1934. Fischer, H., and Orth, H.: Die Chemie des Pyrrols, Leipzig, Akad. Verlagsgesellschaft, 1937. Mason, Courville and Ziskind.³ Watson.⁴⁶

26. Fischer, H., and Libowitzky, H. L.: Auftreten von Uro- bzw. Koproporphyrin I bei akuter Porphyrie, *Ztschr. f. physiol. Chem.* **241**: 220-222, 1936. Turner.³⁰

27. Watson, C. J., and Schwartz, S.: The Excretion of Zinc Uroporphyrin in Idiopathic Porphyria, *J. Clin. Investigation* **20**: 440-441 (July) 1941. Nesbitt and Watkins.¹ Chandler, Harrison and Rimington.¹²

Turner.³

28. Waldenström, Jan; Fink, H., and Hoerbinger, W.: Ueber ein neues bei der akuten Porphyrie regelmässig vorkommender Uroporphyrin, *Ztschr. f. physiol. Chem.* **233**: 1-9, 1935. Dobriner, K.: Simultaneous Excretion of Coproporphyrin I and III in a Case of Chronic Porphyria, *Proc. Soc. Exper. Biol. & Med.* **35**: 175-176, 1936. Mertens, E.: Ueber die bei akuter Porphyrie auftretenden Porphyrine, *Ztschr. f. physiol. Chem.* **250**: 57-79, 1937. Waldenström.¹¹ Weiss.³³

29. Schwartz, Samuel, and Watson, C. J.: Isolation of Uroporphyrin from Feces in Idiopathic Porphyria, *Proc. Soc. Exper. Biol. & Med.* **47**: 390-393, 1941.

30. Turner, W. L.: Studies on Porphyria: III. Acute Idiopathic Porphyria, *Arch. Int. Med.* **61**: 762-773 (May) 1938. Mason, Courville and Ziskind.³

31. Waldenström, Jan, and Vahlquist, Bo.: Studien über die Entstehung der roten Harnpigmente (Uroporphyrin und Porphobilin) bei der akuten Porphyrie aus ihrer farblosen Vorstufe (Porphobilinogen), *Ztschr. f. physiol. Chem.* **260**: 189-209, 1939. Waldenström, Jan, and Wendt, S.: Tierexperimentelle Studien über den Porphyrinstoffwechsel, *ibid.* **259**: 157-162, 1939. Vahlquist, Bo.: Die quantitative Bestimmung des Porphobilinogens im Harn von Kranken mit sogenannter akuter Porphyrie, *ibid.* **259**: 213-221, 1939. Waldenström (footnotes 11 and 20).

32. Watson, C. J., and Schwartz, Samuel: A Simple Test for Urinary Porphobilinogen, *Proc. Soc. Exper. Biol. & Med.* **47**: 393-394, 1941.

33. van der Zoo der Jong, H. H.: Een waarshuwig bij het zoeken naar melanine en haematoporphyrine in de urine, *Nederl. tijdschr. v. geneesk.* **69**: 598, 1925.

34. Maase, C.: Ueber das Auftreten von Skatolfarbstoffen im Harn bei akuter Hämaturporphyrie, *Ztschr. f. klin. Med.* **99**: 270-285, 1924.

35. Weiss, H.: Zur Kenntnis der Porphyrinkrankheiten, *Deutsches Arch. f. klin. Med.* **149**: 255-278, 1925.

36. Fischer, Hans: Ueber das Urinporphyrin, *Ztschr. f. physiol. Chem.* **95**: 34-60, 1915.

acute phases that the urine is most likely to be darkly colored. Ordinarily by the time jaundice and hepatic damage become evident other features of the disease, either abdominal or neurologic, have been present to serve as a clue to the true nature of the disease. The blood pressure may be extremely labile, so that the simultaneous occurrence of hypotension and skin pigmentation may suggest the diagnosis of Addison's disease. Ordinarily hypertension may alternate with periodic hypotension and usually appears at some time during the disease, and the pigmentation of the skin differs from that of Addison's disease in that the mucous membrane is not involved; also the other features of acute porphyria are present to aid in the differentiation of these conditions. The neurologic manifestations of acute porphyria again may suggest a multitude of possibilities.³⁷ It should be noted that Landry's paralysis indicates a clinical course and is not a disease entity. Most important in the differential diagnosis of acute porphyria is infectious polyneuritis,³⁸ which includes the Guillain-Barré syndrome, acute febrile polyneuritis, and acute polyneuritis with facial diplegia, the clinical picture of which may correspond exactly to the neurologic picture of acute porphyria. Infectious polyneuritis, however, almost always occurs in the winter or autumn; usually there is the history of a recent previous infection including the common cold or grip, measles, varicella and pneumonia; also the total protein of the cerebrospinal fluid becomes elevated, ranging from 80 to 800 mg. per hundred cubic centimeters of fluid and the cells may be increased 0-26, usually all lymphocytes, with the "albuminocytologic dissociation." The cerebrospinal fluid in acute porphyria is usually negative except occasionally for the content of demonstrable amounts of porphyrin. Other neurologic conditions which may be suggested by the manifestations of acute porphyria include hysteria, psychoneurosis, acute psychosis, encephalitis, brain tumor, poliomyelitis, progressive muscular atrophy, familial recurrent paralysis, familial periodic paralysis, diphtheritic polyneuritis, tick paralysis,³⁹ triorthocresyl phosphate poisoning (jake leg and apiol paralysis), serum paralysis and parotitic paralysis. Other conditions which might be considered in the differential diagnosis of acute porphyria include periarteritis nodosa, arsenic poisoning, nicotine poisoning, trichinosis and so-called hypertensive encephalopathy.

The pathogenesis of acute porphyria remains obscure, and the metabolism of porphyrins is little understood. A porphyrin constitutes an integral part of the molecular structure of certain vital respiratory pigments, notably hemoglobin, myoglobin and cytochrome. Much evidence has accumulated which would indicate that porphyrin arises in the body during the process of hemopoiesis rather than during the destruction of hemoglobin, as had been supposed formerly.⁴⁰ Waldenström²⁰ reminds us that porphyria might also represent a severe disorder in the metabolism of myo-

globin. Turner⁴¹ suggests the possibility that in porphyria cells other than those of the erythropoietic system may be active in porphyrinogenesis, such as those of the liver, and Turner⁴² has presented evidence which suggests that porphyria may represent a persistence of fetal pyrrole metabolism. A possibility has been mentioned that the metal complex of uroporphyrin may be formed in the intestinal tract or that it may be formed in the body and excreted by the intestinal mucosa.⁴³ Several ingenious theories have been suggested as the possible mechanism responsible for the synthesis of porphyrin within the body which may well depend upon an enzyme system.⁴⁴ Günther⁴⁵ believed that porphyria represents an inborn error of pigment metabolism, and it is reasonable to consider that this may be due to a congenital defect in the enzyme system which may be involved in the formation of porphyrin within the body. Those reports which indicate that the porphyrias are a familial disease have done much to confirm Günther's original idea. Families have been observed in which more than one member was afflicted with the manifestations which are characteristic of acute porphyria, and in some instances there has been proof of such diagnosis by chemical means; in a few instances one member of the family suffered from acute porphyria while another member of the same family suffered from congenital porphyria.⁴⁶ Waldenström¹¹ described many families in which both the acute toxic and the acute idiopathic forms of porphyria occurred in the same family, and he is of the opinion that acute porphyria is inherited and transmitted as a dominant mendelian characteristic. He points out that, although the disease is almost certainly a chronic disorder of constitutional origin, the cause of the acute attack is almost totally obscure.²⁰ It has repeatedly been demonstrated that the metabolic error is not limited to the periods of acute symptoms in these patients but that they may excrete uroporphyrin and its metal complex between such episodes.⁴⁷ It has been mentioned previously that a variety of drugs or toxic substances have been incriminated as etiologic factors in producing acute porphyria. It had formerly been supposed that a constitutional liability need not necessarily be assumed in every instance and that acute toxic and acute idiopathic porphyrias might be caused by some endogenous or exogenous intoxication which affects certain persons who may have an idiosyncrasy.⁴⁸ It might be assumed, of course, that there is always some toxic agent involved as an etiologic factor but that in cases of acute idiopathic porphyria the toxic agent remains unrecognized. Support for such an assumption might be interpreted from a report by Weiss³⁵ of 2 patients in whom acute idiopathic porphyria developed, 1 of the patients having replaced

41. Turner, W. J.: A Theory of Porphyrinogenesis, *J. Lab. & Clin. Med.* 26: 323-330 (Nov.) 1940.

42. Turner, W. J.: Studies on Porphyrin: I. Observations on the Fox Squirrel, *Sciurus Niger*, *J. Biol. Chem.* 118: 519, 1937. Turner and Obermayer.⁸ Turner.³⁰

43. Watson, C. J., and Schwartz, S.: The Excretion of Zinc Uroporphyrin in Idiopathic Porphyrin, *J. Clin. Investigation* 20: 440-441, 1941.

44. Rimington, C.: Some Cases of Congenital Porphyrin in Cattle, *Onderstepoort J. Vet. Sc.* 7: 567, 1936. Dobriner, K.; Strain, W. H., and Localio, S. A.: I. Quantitative Measurement of Coproporphyrin and Total Coproporphyrin I Excretion in Normals, *Proc. Soc. Exper. Biol. & Med.* 36: 752-754, 1937. Turner.⁴¹

45. Günther, H.: Die Bedeutung der Hämatoporphyrine in Physiologie und Pathologie, *Ergebn. d. allg. Path. u. path. Anat.* 20: 609-764, 1922; Günther, H.: Hämatoporphyrine, in Schittenhelm, A.: *Handbuch der Krankheiten des Blutes und der blutbildenden Organe*, Berlin, Julius Springer, 1925, vol. 2, pp. 622-673.

46. Watson, C. J.: The Porphyrins and Their Relation to Disease: Porphyrin, in Christian and MacKenzie's *Oxford Medicine*, New York, Oxford University Press, 1938, vol. 4, pp. 1-34.

47. Nesbitt and Watkins.¹ Waldenström.²⁰ Turner.²⁰

48. Schulte: Ueber Hämatoporphyrinurie, *Deutsches Arch. f. klin. Med.* 58: 313, 1897. Mason, Courville and Ziskind.²

37. Waldenström.²⁰ Hoagland.²⁹

38. Roseman, E., and Airing, C. D.: Infectious Polyneuritis, *Medicine* 20: 463-494 (Dec.) 1941.

39. Abbott, K. H.: Tick Paralysis: A Review, *I. Proc. Staff Meet., Mayo Clin.* 18: 39-45 (Feb. 10) 1943; II, *ibid.* 18: 59-64 (Feb. 24) 1943.

40. Dobriner, K.: Porphyrin Excretion in Feces in Normal and Pathological Conditions, *J. Biol. Chem.* 120: 115-127, 1937. Dobriner, K., and Rhoades, C. P.: The Metabolism of Blood Pigments in Pernicious Anemia, *J. Clin. Investigation* 17: 95-103, 1938. Dobriner, K.; Strain, W. H.; Localio, S. A.; Keutmann, H., and Stephens, D. I.: II. Coproporphyrin I Metabolism and Hematopoietic Activity, *Proc. Soc. Exper. Biol. & Med.* 36: 755-756, 1937. Rimington, C.: Porphyrins and Their Relation to Metabolism of Blood Pigments, *Proc. Roy. Soc. Med.* 32: 1268-1275, 1939. Lemberg, R.: Transformation of Haemins into Bile Pigments, *Biochem. J.* 29: 1322-1336, 1935.

the initial patient in the capacity of cook in a particular restaurant. The disease has never been reproduced in animals by the administration of large doses of the various toxic substances mentioned over long periods of time,³ and also the familial character of porphyria has become more apparent, so that in all probability the toxic substances act only as precipitating factors in a person who has the chronic metabolic disorder. Eldahl believes that other precipitating factors include anxiety, exhaustion and infections.¹⁰

Our knowledge of the exact cause of the various symptoms of acute porphyria remains as obscure as is knowledge of the nature of the fundamental metabolic disorder. Derrien and Benoit⁵⁰ noted the excretion of zinc uroporphyrin and suspected that the loss of zinc from the body might be the most serious factor. Most workers believe that the symptoms are produced by the toxic effect of the abnormal types or amounts of porphyrin, or possibly of other pigments such as urofaecins which are present in the body. The abdominal pain may be due to the action of porphyrin on the sympathetic ganglions or on the smooth muscle of the intestinal tract.³ Roentgenographic examination may reveal dilated portions of the intestinal tract, and at exploratory laparotomy portions of this tract have been found to be in extreme contraction.⁵¹ Experimental evidence would indicate that the action of porphyrin on the autonomic nervous system of the intestine may produce the abdominal symptoms; porphyrin

when injected intravenously or applied locally interrupts the normal rhythmic contractions which the application of atropine does not restore.⁵² Meissner's plexus may be inhibited by porphyrin.⁵³ These reactions may be scattered over the bowel so that spasm and atony may occur in the same portion of the intestinal tract. The central nervous system manifestations may well be attributed to the toxic effect of uroporphyrin or coproporphyrin, which may be present in the cells of this system either in solution or in a finely divided state.⁵⁴ That porphyrins may have an extremely toxic effect on the central nervous system has been demonstrated by the fact that a patient taking hematoporphyrin (Photodyne) developed a severe multiple peripheral neuritis.⁵⁵ The cardiovascular manifestations, notably hypertension, may be due to arteriospasm. Waldenström⁵⁶ has seen angiospasm of the retinal arteries during transient amaurosis, and changes have been noted in the electrocardiogram of a patient with acute porphyria which were interpreted as due to transient myocardial ischemia rather than to infarction, and evidently resulting from coronary artery spasm.⁵⁶ In experimental studies following the injection of coproporphyrin or uroporphyrin into rabbits, the electrocardiogram showed some transient changes.⁵³ Photosensitivity in acute porphyria is rare, but when it does occur it is doubtless caused by porphyrins, which

are well known for their photodynamic properties.⁵⁷ Porphyrins of isomeric series III have less photodynamic action than do those of isomeric series I. Because of the fact that patients with acute porphyria excrete chiefly type III porphyrin while those patients who have congenital porphyria excrete predominantly type I porphyrins, it might be supposed that this accounts for the fact that photosensitivity is the feature of the latter disease but is rare in the former. However, several patients with acute porphyria have been described who excreted chiefly type I porphyrins yet did not exhibit photosensitivity. The frequent association of the acute exacerbation of acute porphyria with menstrual irregularities, notably amenorrhea, has led some to suspect an endocrine factor, though the significance of this is in doubt.²¹ Hyperthyroidism has been reported as developing suddenly in several cases.⁵⁸ One case with a Fröhlich's type of obesity has been described.⁵⁹ Grünewald reported a case characterized by the secretion of colostrum,⁶⁰ and Harbitz reported a case occurring in a man who had swelling of the breasts during an acute episode.⁶¹

Pathologic findings in acute porphyria are usually disappointing. The demonstrable changes in the central nervous system are most often absent or minimal,⁶² consisting of a degenerative process of the peripheral nerves and in the anterior horn cells, an outstanding feature being a patchy degeneration of the myelin sheath. Changes are described in the cells of the sympathetic ganglions including pigmentation, chromatolytic and fusion forms of tigroid changes, nuclear and intracapsular vacuolization, and localized round cell accumulations. More pronounced changes have been described⁶³ which have been essentially cytologic; the cortical cells showed decided pyknosis and in some instances vacuolization of nuclei; many showed no chromatin material and no nucleolus; masses of amorphous pigment were seen in all sections, both iron containing and non-iron containing pigment; the motor cells of the anterior horns of the spinal cord and to a less extent those of the posterior horns at all levels showed apparent pyknosis and shrinking, and the same types of pigment were observed; the Purkinje cells of the cerebellum showed definite signs of degeneration; in some places extensive myelin degeneration of the peripheral nerves was noted as well as round cell infiltration, and a few phagocytic cells containing brown pigment. Uroporphyrin or coproporphyrin either in solution or in a finely divided state has been demonstrated within the cells of the central nervous system.⁵⁴ Pathologic changes have been described in various other organs of the body.⁶⁴ The liver may be considerably enlarged, and the hepatic cells may show changes ranging from diffuse cloudy swelling to atrophy and areas of central necrosis. The hepatic cells may contain increased amounts of a brownish yellow pigment, and the Kupffer cells may be enormously

49. Eldahl, A.: A Case of Acute Porphyria Developed During Hospitalization, *Acta med. Scandinav.* **97**: 415-419, 1938.

50. Derrien, E., and Benoit, C.: Urine and Organs in Acute Porphyria, *Arch. Soc. d. sc. med. et biol. de Montpellier* **8**: 456, 1929.

51. Mason, Courville and Ziskind.³ Chandler.¹²

52. Leitner, Z. A.: The Physiology of the Small Intestine: Its Application to the Etiology of Sprue, *Trop. Dis. Bull.* **39**: 497-508 (Aug.) 1942. Reitlinger, K., and Klee, P.: Zur biologischen Wirkung der Porphyrine, *Arch. f. Exper. Path. u. Pharmacol.* **127**: 277-286, 1928. Vannotti, A.: Zwei seltene Fälle von Porphyrie (Klinischer und experimenteller Beitrag zum Studium der sekundären Porphyrie), *Ztschr. f. exper. Med.* **97**: 377-397, 1935.

53. Vannotti, A.: Porphyrine und Porphyrikrankheiten, Berlin, Julius Springer, 1937, p. 286.

54. Borst, M., and Königsdorfer, H.: Untersuchungen über Porphyrie, Leipzig, S. Hirzel, 1929.

55. Thorner, M. W.: Multiple Neuritis from Therapy with Hematoporphyrin, *J. A. M. A.* **108**: 969-970 (March 20) 1937.

56. Eliaser, M., Jr., and Kondo, B. O.: Electrocardiographic Changes Associated with Acute Porphyria, *Am. Heart J.* **24**: 696-702, 1942.

57. Stokes, J. H.; Beerman, H., and Ingraham, N. R., Jr.: Photodynamic Effects in Dermatology: II, *Am. J. M. Sc.* **204**: 601-624 (Oct.) 1942.

58. Barker, L. F., and Estes, W. L., Jr.: Family Hematoporphyrinuria and Acute Polyneuritis, *J. A. M. A.* **59**: 718-719 (Aug. 31) 1912. Vannotti.⁵³

59. Magendantz, H.: Ein Fall von akuter Porphyrie, *Nervenarzt* **9**: 76, 1936.

60. Grünewald, E. A.: Studien zur Pathogenese der Landryschen Paralyse, *J. f. Psychol. u. Neurol.* **29**: 403-428, 1922-1923.

61. Harbitz, Francis: Hematoporphyrinuria as an Independent Disease and as a Symptom of Liver Disease and Intoxication, *Arch. Int. Med.* **33**: 632-642 (May) 1924.

62. Mason, Courville and Ziskind.³ Waldenström.⁵⁶ Taylor.¹⁰

63. Palmer, H. W.: Acute Idiopathic Porphyria with Acute Ascending Paralysis, *Ann. Int. Med.* **13**: 1500-1508, 1940.

64. Nesbitt and Watkins.¹ Mason, Courville and Ziskind.³ Palmer.⁶³ Correll, Peters and Murphy.²¹

enlarged, the cytoplasm containing much iron containing as well as iron free pigment. The spleen may be increased considerably in size and show proliferation of the reticular cells and hyalin fibrinoid change in the reticular cells of the malpighian bodies. Large amorphous masses of the brownish pigment may be scattered throughout as well as being present within macrophagocytes within the sinusoids and also over the entire red pulp. The kidneys may show occasional nests of pigment granules, mostly iron free, within the endothelial cells of the glomerular capillaries and in the cytoplasm of the tubular epithelial cells, and there may be noticeable diffuse cloudy swelling of the epithelium of the tubules with complete atrophy in places. The same degenerative changes may occur also in the glomeruli. The bone marrow may appear hyperplastic, and occasional large cells laden with brown pigment may be seen. Considerable muscle atrophy may be present,⁶⁵ and the heart may show poor staining of the cross striations of fibers with areas of interstitial round cell infiltration as well as hemorrhages into interstitial spaces and fatty degeneration of muscle fibers.

The prognosis of acute porphyria during an exacerbation should be extremely guarded. It has been pointed out¹⁵ that the disease is in reality a chronic one and that after its first appearance it may extend over a period of time ranging from months to many years. Of 100 patients who were the subject of the report by Waldenström¹¹ 20 died within one year following the appearance of the disease clinically, 2 lived eight years, and of 12 living patients 1 had lived for twenty-seven years. The immediate mortality during the acute episodes, however, may be very high, particularly on the onset of neurologic manifestations, when it may be as high as 80 to 90 per cent.⁶⁶ Frequent causes of death are respiratory failure resulting from bulbar palsy, secondary infection, particularly pneumonia, which may result from the patient's generally debilitated state associated frequently with bulbar weakness, and hepatic insufficiency.¹⁰ As yet there is no specific or satisfactory treatment for acute porphyria, and symptomatic and supportive measures only are available. Obviously any of the toxic agents which have been incriminated as precipitating agents, notably the barbiturates during recent years, should be avoided; physical or mental fatigue as well as any infection, as far as possible, should be avoided. Intensive therapy with various vitamins has been suggested, but with doubtful or disappointing results. The use of liver preparations has proved to be of little or no avail.⁶⁷ Strong sunlight should be avoided, particularly in those occasional cases of acute porphyria in which photosensitivity is apparent.¹ Calcium forms insoluble salts with the porphyrins, and its use when parenterally administered has been reported to diminish the excretion of porphyrin in the urine as well as to relieve the abdominal pain.⁶⁸ In my experience such use of calcium has been disappointing. The nutritional status of the patient must be maintained, and this is particularly important with the occurrence of jaundice

and severe hepatic damage; the use of a feeding formula by means of a duodenal tube may be necessary.⁶⁹ With the onset of neurologic manifestations the patient must be watched carefully for evidence of bulbar weakness. In such an event mucus should be aspirated from the throat and trachea when necessary, and access to a respirator should be assured. After the acute episode physical therapy, including regulated passive and active exercises and massage, may be of value.

REPORT OF CASES

The cases to be presented occurred in the same family, of which certain essential data are presented in the genealogical chart. Cases 2 and 3 were detected during an extensive survey of the family initiated during a study of case 1. The urine of 43 accessible members of the family was tested for porphobilinogen,³² to which test the urine in cases 2 and 3 gave a strongly positive reaction, as a result of which these cases were more completely studied. The diagnosis of porphyria was further substantiated in all these cases by additional chemical studies, which included the isolation and identification of uroporphyrin from the urine. The remaining members of the family, in which the porphobilinogen test was negative, were not studied further. That the disease in this instance has been transmitted through the paternal line is evidenced by the fact that patient 3 is a paternal cousin of the first 2 patients. In this regard it is interesting to note that the paternal grandfather died at 49 years of an illness characterized by abdominal pain; complete quadriplegia and dementia, very possibly acute porphyria, although chemical proof of this is lacking.

CASE 1.—History.—A woman aged 24, a housewife of German and Italian parentage, had always enjoyed excellent health and never had observed anything unusual about the color of her urine. Prior to her present illness she had taken no medicine nor been exposed to evident toxic agents. Five and one-half months before coming to the New Haven Hospital she had experienced the onset of severe, diffuse, colicky abdominal pain associated with nausea and vomiting occurring at almost daily intervals and lasting for hours or days. She suffered from extreme constipation, whereas formerly her bowels had always been regular. Her family noted a distinct personality change: formerly always cheerful and pleasant, she became nervous, irritable and depressed. She feared insanity and wanted to die. She experienced "fits," when she would suddenly run screaming about the house. There was increasing weakness, so that within two weeks she could take no more than a few steps, and her hands were so weak that she could not use them. At this time a two months pregnancy was interrupted by a spontaneous abortion. She entered another hospital, where dilation and curettage was done, and it was noted that the urine, although red, contained only an occasional erythrocyte. At that time her blood pressure was 130 mm. of mercury systolic and 90 diastolic. Her convalescence was uneventful but not smooth, owing to her irritability and lack of cooperation. This was the patient's second pregnancy, her first having been normal throughout. Following that episode she seemed to regain some strength in her extremities, but her general condition became progressively worse. The abdominal pain recurred almost daily, associated still with nausea and vomiting, the longest interval of comparative freedom being about one week. She lost 35 pounds (16 Kg.). Amenorrhea was complete during this entire interval. There was increasing frequency and urgency of urination, especially at night; she was able to pass only small amounts of urine at a time. Her mental condition became worse, so that she was sent to her mother's home in the

65. Sachs, Paula: Ein Fall von akuter Porphyrrie mit hochgradiges Muskelschwäche, *Klin. Wchnschr.* 10: 1123-1125, 1931.

66. Mason, Courville and Ziskind.² Waldenström.¹¹

67. Waldenström.¹¹ Turner and Obermayer.¹

68. Hoerburger, W., and Fink, H.: Ueber Porphyrine bei klinischer Porphyrrie, *Ztschr. f. physiol. Chem.* 236: 136-140, 1935. Massa, M., and Battistini, G.: Porphyrinuria sperimentale, porfirinuria patologica e loro scomparsa dopo introduzione endovenosa di sali di calcio, *Pathologica* 25: 28-32, 1933. Mason, Courville and Ziskind.² Fischer and Libowitzky.² Waldenström, Fink and Hoerburger.²⁵

69. Snell, A. M., and Butt, H. R.: Hepatic Coma: Observations Bearing on Its Nature and Treatment, *Tr. A. Am. Physicians* 56: 321-329, 1941. Nesbitt and Watkins.¹

country because of her screaming. She possessed ideas of persecution by members of the family and frequently threw herself down to pound her head against the floor. On one occasion she attempted to obtain iodine for suicidal purpose.

She was admitted to the surgical service of the New Haven Hospital five and one-half weeks after the onset of her illness. She appeared worried and anxious. The pulse rate was 136 and the temperature by mouth 98.6 F. The blood pressure was 140 mm. of mercury systolic and 100 diastolic. Despite the constant complaint of cramplike pain in the left upper quadrant, the abdomen remained soft and without muscle spasm. The reflexes were normal. The left ovary was palpable, and the thyroid gland was symmetrically and moderately enlarged and of normal consistency. The cramplike abdominal pain shifted to an area across the lower abdomen, recurring at half hour intervals leaving a residual sore, aching pain. On the second hospital day she was found comatose, legs extended, arms flexed, jaws tightly clenched and with tonic and clonic convulsive movements of the extremities. Fibrillary twitchings were noted over various muscle groups. The blood pressure was 155 systolic and 112 diastolic. Diagnostic impressions until this time had included ovarian cyst, ectopic pregnancy, anxiety state, hysteria, cerebral vascular accident including ruptured congenital aneurysm, encephalitis, idiopathic status epilepticus, expanding intracranial lesion, acute pituitary necrosis and catatonic schizophrenic stupor. The coma persisted, there was a

was 21.5 to 19.2 milliequivalents, the chlorides 65.3 to 99.6 milliequivalents. The total serum proteins were 5.17 Gm. per hundred cubic centimeters of serum, the albumin-globulin ratio being 3.31/1.86, and the blood sugar was 78 mg. per hundred cubic centimeters of blood. The icterus index ranged from 6.7 to 15 units, the van den Bergh test gave the indirect reaction, and the cephalin flocculation test was strongly positive. The cerebrospinal fluid was examined on three occasions, the pressure ranging from 135 to 240 mm. of water, the erythrocytes from 0 to 21, lymphocytes from 0 to 16 per cubic millimeter of fluid, the protein from 56 to 92.6 mg. per hundred cubic centimeters of fluid, the Pandy test 4 plus, the Wassermann test negative and the colloidal gold curve normal. No porphyrin could be demonstrated in the cerebrospinal fluid, which gave a negative porphobilinogen test. Roentgenographic examinations of the chest and skull gave negative results. Routine examination of the urine revealed no albumin, sugar, acetone or cells; the urine was acid in reaction and the specific gravity ranged from 1.013 to 1.032. The color of the freshly voided urine varied from a normal yellow or colorless to orange, burgundy red or dark brownish red. On standing the urine invariably became very dark and nearly black. All urine examined gave a strongly positive test for porphobilinogen. Spectroscopic examination of many specimens revealed the presence of uroporphyrin as the zinc metal complex. The porphyrins were isolated from the urine by an

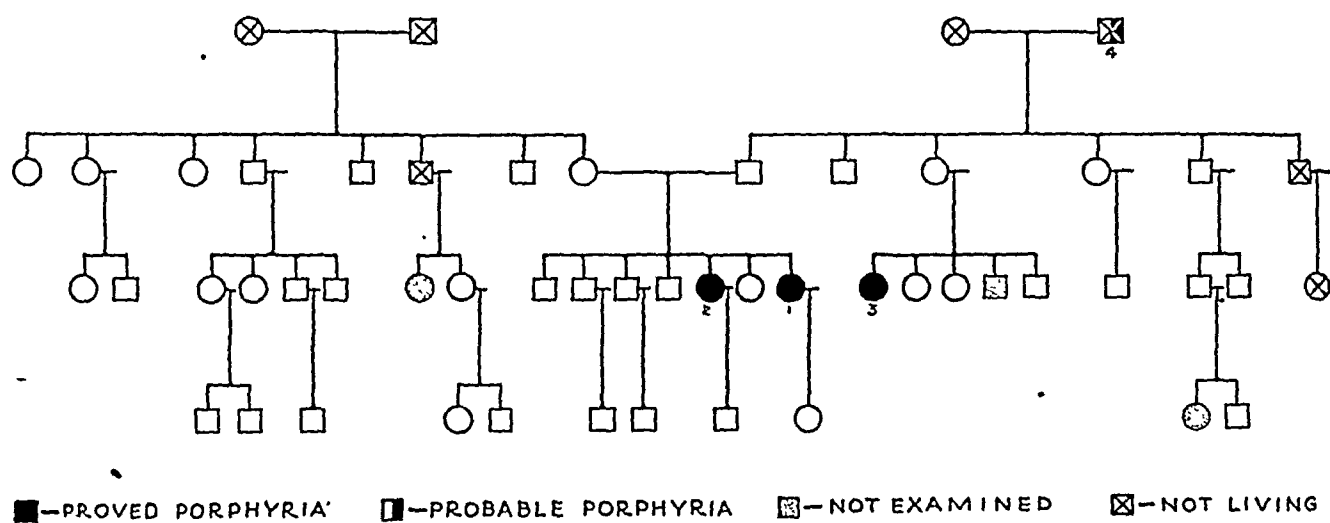


Fig. 1.—Essential data of family. Cases numbered as in text.

pronounced fall in her blood pressure, and she was transferred to the medical service on the fourth hospital day. The patient was stuporous but responded and attempted to cooperate, being somewhat facetious. The pulse rate was 134 per minute, the temperature 101 F. and the blood pressure 70 systolic and 50 diastolic. The lungs were clear to auscultation and percussion. The pupils were round and reacted to light; the left pupil was widely dilated. The patient was emaciated; there was decided extensor weakness of the extremities and striking atrophy of the interosseous muscles of both hands. The deep reflexes were diminished to absent everywhere. The abdominal reflexes were absent; the plantar response was normal. Speech was difficult and somewhat slurred. There was no obvious cranial nerve weakness. The ocular fundi were not remarkable. Examination of the abdomen was negative except for evidence of a hugely dilated colon. The clinical picture suggested the diagnosis of acute porphyria. This impression was strengthened by the fact that the urine was found to be dark reddish brown, although it did not contain blood, and the diagnosis was confirmed by appropriate chemical investigations.

Laboratory Studies.—The concentration of hemoglobin was 11.2 Gm. per hundred cubic centimeters of blood; the erythrocytes numbered 4,390,000 and the leukocytes 7,200 per cubic millimeter of blood, with 17 per cent lymphocytes and 83 per cent neutrophils. A routine flocculation test for syphilis was negative, the blood group was of type A, a blood culture was negative, and the Aschheim-Zondek test was negative. The nonprotein nitrogen ranged from 42 to 20 mg. per hundred cubic centimeters of serum, the serum carbon dioxide content

adsorption method similar to that described by Grotepass⁷⁰ but modified for the recovery of uroporphyrin. The porphyrins were further purified by chromatographic analysis and identified by determination of the melting point of the methyl ester. From a 8,500 cc. pooled urine collection there were isolated 17.875 mg. of uroporphyrin III and 4.46 mg. of coproporphyrin III.

Treatment and Course.—Immediate treatment was directed toward the correction of salt depletion, resulting from prolonged vomiting, and vascular collapse; it consisted of transfusion and the parenteral administration of 2 per cent as well as isotonic solution of sodium chloride and 5 per cent dextrose solution. She had received large doses of barbiturates including pentobarbital sodium, phenobarbital, seconal and intravenously administered phenobarbital sodium; the use of all such medications was promptly discontinued. She received large doses of vitamin preparations administered intramuscularly, including thiamine hydrochloride about 500 mg. and nicotinamide about 600 mg. daily. The blood pressure promptly resumed previous hypertensive levels, ranging about 140 mm. of mercury systolic and 100 diastolic. Her condition was extremely variable from day to day particularly in reference to strength and consciousness. On one day there would be almost complete paralysis of her extremities, always most prominent in the proximal muscle groups, which would show considerable improvement from time to time, with increased paralysis alternating with

70. Grotepass, W.: Zur Kenntnis der natürlichen Harnporphyrine, Ztschr. f. physiol. Chem. 253: 276-280, 1938.

periods of improvement. At times the gag reflex would be present, at other times completely absent. She steadily became weaker until there was complete flaccid paralysis of all the extremities, the deep reflexes being absent. Speech became increasingly more difficult until she could not phonate. Respiration became rapid, labored and costal in type, with an attempt to utilize the accessory muscles of respiration. There was a suggestion of hypalgesia of the first division of the fifth cranial nerve bilaterally. Swallowing became difficult, there was considerable drooling, and much watery material which became purulent was aspirated repeatedly from the trachea. The lung fields became filled with moist crepitant and crackling rales, and there was evidence of diffuse pulmonary consolidation. Despite the use of a respirator and oxygen she became more and more cyanotic, became comatose and died on the fifteenth hospital day.

Necropsy.—The only anatomic findings of importance included organizing focal pneumonia, bilateral; cystitis; ovarian cyst, left; small quiescent adenoma of the thyroid and a kyphoscoliosis of the dorsal spine. There were no changes in either the central or the peripheral nervous system. The spinal ganglions and paravertebral ganglions showed no lesions. The zinc content of the liver and pancreas was determined by the dithizone technic and was not remarkable. The liver contained 22.3 mg. of zinc per hundred grams of dry tissue, the pancreas contained 9.8 mg. A study of the porphyrin content of various organs is in progress.

CASE 2.—History.—A woman aged 29, sister of patient 1, a housewife, had never noted any abnormal color of her urine and at the time of examination she presented no complaints. She was attending the obstetric clinic because of a normal pregnancy of three months' duration. She had completed a normal pregnancy and delivery four years previously. Just prior to that pregnancy she had experienced a miscarriage during the fourth month; this was not associated with any unusual abdominal pain or other complaint. Five months before admission she had experienced an illness of nine days' duration characterized by severe cramplike pain across the lower abdomen, nausea and vomiting, and complete cessation of bowel movements. She was able to ingest only fluids and lost 10 pounds (4.5 Kg.). There were no neurologic symptoms. The illness was attributed by her family physician to the ingestion of warmed over succotash, although the entire family had eaten this food without ill effect. Physical examination was essentially negative. The patient was cheerful and cooperative. The blood pressure was 120 mm. of mercury systolic and 80 mm. diastolic. The heart, lungs and abdomen were normal; the uterus was enlarged symmetrically commensurate with a three months pregnancy. Examined under ultraviolet light there was no abnormal fluorescence anywhere, including the teeth and the areas of apocrine gland distribution.

Laboratory Studies.—The concentration of hemoglobin was 12 Gm. per hundred cubic centimeters of blood; the erythrocytes numbered 3,700,000 and the leukocytes 7,000 per cubic millimeter of blood. The percentages of the various types of leukocytes were neutrophils, nonsegmented 13, segmented 55, lymphocytes 26, monocytes 3 and eosinophils 2. Routine flocculation test for syphilis was negative; the blood group was type A. Routine urine examination showed a cloudy yellow color, neutral reaction, specific gravity of 1.021, 3 to 5 leukocytes per high power field, occasional epithelial cells, no albumin and no sugar. All specimens of urine examined were a normal yellow or of a colorless appearance and gave a strongly positive test for porphobilinogen. On standing the urine became extremely dark and almost black. From a 2,250 cc. forty-eight hour collection of urine there were isolated 6.755 mg. of uroporphyrin I, 1.36 mg. of uroporphyrin III and 1.81 mg. of coproporphyrin I. The native urine did not show fluorescence in ultraviolet light, nor did spectroscopic examination reveal distinct absorption.

It was evident that this patient had the fundamental metabolic disorder of porphyria, but at the time she presented no referable complaints and so was classified as having latent porphyria. It is quite possible that the illness in the past, characterized by abdominal pain, nausea, vomiting and ileus, represented an acute episode of this disease which was not recognized as

such. The situation was explained to the patient and her family. She was advised never to take drugs of any kind except when absolutely necessary, then only under the direction of a physician, and in particular to avoid sedatives, soporifics and "patent medicines." She was also instructed to avoid infections as far as possible, as well as mental and physical fatigue, all of which might possibly precipitate an acute episode. The obstetric department was acquainted with the situation, and it was suggested that sedation and anesthesia be completely eliminated at the time of the patient's delivery if at all possible.

CASE 3.—History.—A single woman aged 26, employed as a cashier, a paternal cousin of patients 1 and 2, refused to enter for examination and her history was obtained from other members of the family. She had always enjoyed excellent health and presented no referable complaints. She had suffered from "pleurisy" for several weeks recently, which had been treated at home and the details of which were not available.

Laboratory Studies.—All urine specimens received were of a normal, clear yellowish appearance which turned nearly black on standing. The urine gave a strongly positive test for porphobilinogen. From 1,100 cc. of this patient's urine were isolated 0.82 mg. of uroporphyrin III and 0.28 mg. of coproporphyrin III.

Again it was evident that the patient had the fundamental metabolic error of porphyria which was classified as latent porphyria. This was discussed with the family, and it was stressed that she should avoid all drugs and anything which might conceivably precipitate an acute attack.

COMMENT

The problem of acute porphyria has been reviewed with particular reference to the clinical aspects of the disease, historical consideration, classification of the porphyrias, diagnosis, differential diagnosis, pathogenesis, pathology, prognosis and treatment. The terms "hematoporphyrinuria" and "hematoporphyrinuria" are misnomers and their use should be abandoned. Acute toxic porphyria and acute idiopathic porphyria are indistinguishable clinically or by laboratory means and probably represent the same disease; acute toxic porphyria is recognized only on the basis of a toxic agent, usually a barbiturate, which may act only as a precipitating factor in causing an acute episode. Acute porphyria is in reality a chronic disease characterized usually by exacerbations and remissions over a period of months or years.

The diagnosis of acute porphyria will be made only if it is borne in mind and considered as a possibility in any case of unusual abdominal complaints or symptoms referable to the central nervous system, particularly when these occur together, or when associated with the excretion of abnormally colored urine. It would seem that the disease is not as unusual as has formerly been supposed and that with a more general knowledge of the subject more cases will be detected.

Three cases of acute porphyria occurring in the same family have been presented. The investigation of 43 members of this family was made possible by the use of a simple test for urinary porphobilinogen. In each of the 3 cases the diagnosis was further confirmed by the isolation and identification of uroporphyrin from the urine. These cases indicate that acute porphyria is as much a familial disease as is congenital porphyria and that the underlying mechanism is an inborn error of pigment metabolism as suggested originally by Günther.

Case 1 represents the picture of classic acute porphyria and demonstrates the problems which may be presented in differential diagnosis. A feature of this patient's course was the changing neurologic picture from day to day. Necropsy findings were disappoint-

ing. The zinc content of the liver and pancreas was not abnormal and would indicate that zinc depletion is not a factor of the disease. Careful balance studies might serve to indicate what role zinc plays in this disease, which is characterized by the excretion of the zinc metal complex of uroporphyrin. It is possible that zinc may be of importance as a detoxicating mechanism, or it may be an integral factor in an as yet unknown enzyme system concerned with porphyrin metabolism.

Case 2 represents the unusual condition in which the isomeric series I of uroporphyrin and coproporphyrin are predominant in the urine; usually porphyrins of isomeric series III predominate in the urine of patients with this type of porphyria.

Cases 2 and 3 are examples of latent porphyria in which there are no clinical manifestations of the disease, although it is evident that the inborn metabolic disorder exists from the standpoint of chemical investigation. The importance of detecting such cases is indicated; the patient must be acquainted with the situation and instructed in regard to the avoidance of those things which might act to precipitate an acute episode.

THE OBLIQUELY OVATE OR NAEGELE PELVIS

A COMMENTARY AND A REPORT OF FOUR CASES

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As early as 1803 Franz Carl Naegele¹ recognized the morphology of the obliquely ovate pelvis and in his celebrated monograph published in 1839 he based his observations on the study of 37 specimens. He defined the deformity as a "pelvis contracted in one of the oblique diameters with complete ankylosis of the sacroiliac synchondrosis on one side, combined with imperfect development of the sacrum and os innominatum



Fig. 1.—Appearance of pelvis in case 1.

on the same side." At the time of his writing, Naegele observed that the deformity had never been recognized in the living person. Today, without the aid of roent-

genology, the same difficulty of diagnosis apparently obtains, as witnessed by the experience here reported.

When one considers the supposed rarity of this type of pelvic deformity, the observation of 4 cases in almost as many years in the material presenting itself in a relatively small teaching clinic is something of a revelation. In the 1941 edition of the Williams-Stander²



Fig. 2.—Appearance of pelvis in case 2.

textbook we read that "Thomas in 1861 was able to collect from the literature 50 of such pelves. Since then additional specimens have been described, but it is unlikely that the entire number greatly exceeds 100." Other authorities seem to be in agreement that the Naegele pelvis is one of great rarity and many obstetricians of extended experience claim never to have encountered an instance. As will be shown later, such a supposed rarity can be explained, for in some women with this type of pelvic deformity birth of a living child through the natural passages is possible.

REPORT OF CASES

A brief history of the cases that I have observed follows:

CASE 1.—A nulliparous white woman aged 33, of Irish descent, with no history of serious illness in childhood, had pyelitis in 1928 and the left kidney was removed. The specimen showed double pelvis and double ureter. In January 1938 a flat abdominal roentgenogram was made during an investigation for lower left quadrant pain. The Naegele type pelvis was seen. (Note: From 1932 to 1938 eight pelvic examinations were done by 6 men but nothing in their notes showed any evidence that the pelvic deformity was recognized.) The external appearance of the patient was not unusual; scoliosis was not readily noticeable. She never had been pregnant.

CASE 2.—An Italian woman aged 38, seen in the antepartum clinic in December 1939 in her fourth pregnancy, was first pregnant in 1925; delivery was by forceps, and the child weighed 7 pounds 8 ounces (3,400 Gm.). The second pregnancy occurred in 1928, with spontaneous delivery of a child weighing 7 pounds 14 ounces (3,570 Gm.). At the third pregnancy, in 1931, the patient was delivered at home of a child weighing "over 8 pounds" (3.6 Kg.) and was said to have suffered a birth injury. At the fourth pregnancy, vaginal examination was made by Dr. DeWitt Dominick Dec. 26, 1939, who confirmed the pregnancy and, because of abnormality of the lower pelvis, referred the patient for roentgen pelvimetry. The diagnosis was Naegele pelvis with deformity on the right side. The patient's antepartum course was uneventful until the end of the pregnancy, when symptoms of toxemia appeared and multiple pregnancy was noted. On June 18, 1940 she delivered spontaneously male twins weighing 2,830 and 2,725 Gm. (Note: This patient visited the gynecologic clinic in 1934

2. Standar, H. J.: Williams Obstetrics, ed. 8, New York, D Appleton-Century Company, Inc., 1941.

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This study was made possible through the Clinical Research and Teaching Fund of Yale University School of Medicine.

1. Naegele, F. C.: Das schrag verengte Becken, nebst einem Anhang über die wichtigsten Fehler des weiblichen Beckens überhaupt, Mainz, V. von Zarnen, 1839; The obliquely Contracted Pelvis, Containing Also an Appendix of the Most Important Defects of the Female Pelvis, Centennial Edition, translated by A. M. Hellman and G. Musa, New York, Pynson Printers, Inc., 1939.

for "pains in the lower abdomen." At that visit and on four subsequent visits vaginal examination was done, each time by a different attendant. No mention of pelvic deformity appears on the record.)

CASE 3.—A white American woman aged 28, seen Oct. 1, 1940 in her third pregnancy, at her first visit to this clinic was examined vaginally by Dr. C. B. Crampton, who noted that the pelvis presented a deformity and referred the patient for roentgen pelvimetry. A typical Naegele pelvis was noted with deformity on the right side. The patient did not walk with any noticeable limp. The first pregnancy, in 1935, was terminated by forceps and a $7\frac{1}{2}$ pound (34 Kg) child delivered, now living and well. The second pregnancy, with forceps, resulted in a stillbirth of a $9\frac{1}{2}$ pound (43 Kg) child. The third pregnancy proceeded to term without incident and the patient was delivered by elective cesarean section of a 3,890 Gm. child. This patient gives a history of osteomyelitis during the first three years of life, which accounts for numerous scars in the region of the left hip due to incisional drainage.

CASE 4.—An Italian woman aged 27, first seen Aug. 2, 1943, expected confinement Feb. 3, 1944. Routine roentgen pelvimetry showed a typical Naegele type pelvis. At the present time the patient is progressing satisfactorily in pregnancy. The past history is interesting for, at the age of 2 years, the patient was operated on in a local hospital for incision and drainage of the left thigh for a tuberculous abscess. The resulting scar from this procedure is seen in the region of the left trochanter. The method of delivery of this patient is not definitely decided on and a further study of cephalopelvic relationships will be made at term. It is likely, however, that cesarean section will be the procedure of choice.

ETIOLOGY

Naegele, in discussing the origin of the deformity, wrote "I confess that my original opinion about it, namely that the deformity originates neither from external force nor from disease but by a deviation in the original development, appears the most probable." However, somewhat later, in 1860, Thomas³ stated that in certain cases inflammatory disease was responsible for the condition. Breus and Kolisko⁴ in 1900 went even further and stated that the condition was always the result of inflammatory disease and the history would substantiate this fact. In 1929 Williams⁵



Fig. 3.—Appearance of pelvis in case 3

stated that this may not apply to the individual case and in his case, as well as in that of Reinberger⁶ in 1933, an embryonic defect was the only explanation of the deformity. Berry Hart⁷ in 1917 summarized his views, stating that "The true Naegele and Robert

pelves have not had a previous osteitis with resulting ankylosis in the region of the sacroiliac joints, followed by disturbed weight transmission. The pseudo-Naegele and pseudo-Robert pelves have had a previous osteitis in these regions and there the synostosis and atrophy are the result of this. The forms of the Naegele and Robert pelves are the result of polar losses of the size



Fig. 4.—Appearance of pelvis in case 4

elements of the alae sacri and innominate bones, due to maturation of the sperm and germ cells. In these the loss of the alae sacri and innominate determinates has occurred, a great rarity, more often a unilateral loss (Naegele) than a bilateral one (Robert). The sacroiliac ankylosis is due to the fact that by such losses (bony elements and joint elements) the part remaining, imperfectly developing, becomes ankylosed. As this is a germ plasma change and multiplication of the reduced elements occurs, it may be transmitted."

In considering the cases here presented, it is interesting to note that in case 1 coexistent malformations were present and that they were definitely associated with the urogenital system, as in Reinberger's case, and that reported by the Rivières.⁸ In case 2 there was nothing in the history or physical findings to suggest either associated malformation or previous disease. In case 3 the history of osteomyelitis during the first three years of life is not of great speculative interest, for the deformity occurred on the side opposite to the bone lesion. In case 4 the previous tuberculous lesion was on the same side as the deformity, but the structure of bone in the region of the sacroiliac region does not suggest any previous pathologic process.

DIAGNOSIS

Without the use of roentgen technics it is apparent that the diagnosis of Naegele pelvis in the living presents difficulties. In 2 of the foregoing cases in which childbirth had taken place it seems apparent that the true deformity was unsuspected. In case 1 the deformity was not discovered until roentgen technics were employed during a urologic investigation. An instance of the diagnostic difficulty by ordinary methods is seen in cases 2 and 3, in which numerous vaginal examinations were made by presumably competent observers. In all fairness to them, however, it should be pointed out that our knowledge of the frequent existence and the obstetric importance of midplane pelvic contractions has been emphasized only comparatively recently. The absence of obvious external deformity and change in gait also contribute to the obscurity of diagnosis. The

8. Riviere and Riviere: Bull. Soc. d'obst. et gynec. de Paris 12: 85, 1923.

3. Thomas, A. E. S.: Arch. f. d. holländ. Beitr. z. Nat- u. Heilk. Utrecht 2: 270, 1860.

4. Breus, C., and Kolisko, A.: Die pathologischen Beckenformen, Leipzig, F. Deuticke, 1900.

5. Williams, J. W.: Am. J. Obst. & Gynec. 18: 504, 1929.

6. Reinberger, J. R.: Am. J. Obst. & Gynec. 25: 834, 1933.

7. Hart, D. B.: Edinburgh M. J. 18: 4, 1917.

transverse diameter of the outlet is always diminished, so that in examining vaginally there is a definite sense of constriction. In lateral vaginal palpation the pelvic wall on the affected side is found to be definitely displaced toward the midline. If vaginal palpation of the pelvic sidewalls was carefully made at least once during the antepartum period of every pregnant patient it is probable that the diagnosis would not be overlooked. At least a roentgen investigation would be suggested in such instances and the diagnosis would be settled thereby.

The importance of routine roentgen pelvimetry for every primigravid woman again becomes obvious, for if gross pelvic anomalies, such as Naegele pelvis, can be so easily overlooked, lesser but equally important pelvic changes will remain likewise undiscovered by the ordinary methods of investigation. Our experience with six years of routine roentgen pelvimetry for this group greatly strengthens this opinion.

SUMMARY

1. The observation of four Naegele type pelvis within five years in a relatively limited amount of material demonstrates that this type of pelvic deformity is not of the extreme rarity formerly supposed.

2. Unless careful palpation of the pelvic side walls is done at vaginal examination, the condition apparently may be easily overlooked. Roentgen pelvimetry will always establish the diagnosis.

3. In some women with this type of deformity the birth of a living child through the natural passages is possible.

4. The importance of at least one roentgenometric pelvic survey for every primigravid woman is an obstetric ideal which will rapidly become realized when the advantages of the procedure are fully appreciated.

Clinical Notes, Suggestions and New Instruments

A CASE OF POLIOMYELITIS IN A NEWBORN INFANT

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The age of susceptibility to poliomyelitis has been of great interest to students of the disease. The problem of fetal infection has been studied by Bradly and Lenarsky,¹ by Kleinberg and Horwitz² and by Harmon and Hoyne,³ who conclude that in pregnancy there is apparently a failure of fetal infection to occur during the course of poliomyelitis.

Cases occur infrequently in the infant under 6 months of age. This may be correlated with the findings of Shaughnessy, Harmon and Gordon⁴ and of Aycock and Kramer,⁵ who found that the infant usually shows antibodies if the mother has neutralizing antibodies in her blood. These appear to persist for several months after birth.

The incubation time of acute anterior poliomyelitis likewise has been a matter of much discussion among epidemiologists

This case was discovered in the course of a survey of epidemics made for the National Foundation for Infantile Paralysis, Inc.

1. Bradly, M. B., and Lenarsky, Maurice: *Acute Epidemic Poliomyelitis Complicating Pregnancy*, J. A. M. A. **101**: 195 (July 15) 1933.

2. Kleinberg, Samuel, and Horwitz, Thomas: *The Obstetrical Experience of Women Paralyzed by Acute Anterior Poliomyelitis*, Surg., Gynec. & Obst. **72**: 58 (Jan.) 1941.

3. Harmon, P. H., and Hoyne, Archibald: *Poliomyelitis and Pregnancy*, J. A. M. A. **123**: 185 (Sept. 25) 1943.

4. Shaughnessy, H. J.; Harmon, P. H., and Gordon, F. B.: *The Neutralization of Poliomyelitis Virus by Human Serum*, J. Prev. Med. **4**: 463, 1930.

5. Aycock, W. L., and Kramer, S. D.: *Immunity to Poliomyelitis in Mothers and the Newborn as Shown by the Neutralization Test*, J. Exper. Med. **52**: 457, 1930.

of the disease. The following case histories concern a mother and child who were victims of poliomyelitis during the 1943 season:

MOTHER'S HISTORY

Mrs. A. G., aged 26, entered the Wichita General Hospital on Oct. 23, 1943 at 1:25 a. m. with definite contractions of labor every five minutes, the pains lasting thirty to forty seconds. On admission the temperature of 98.2 F., pulse 78 and respirations 18 was recorded. Rectal examination at the time revealed 4 cm. dilatation of the cervix and outline well effaced. The history previous to these findings was negative except for a sore back for one day prior to admission to the hospital, which was believed due to the beginning of labor. At 2:30 a. m. contractions became stronger and 1½ grains (0.1 Gm.) of pentobarbital sodium was given. At 5:19 a. m. normal delivery of a 7 pound 3 ounce (3,260 Gm.) boy occurred.

The placenta was expressed intact and a second degree laceration repaired. The first rise in temperature was noted at 4 p. m., about eleven hours after delivery, at which time the temperature of 100.6 F., pulse 96, respirations 18 was recorded. On the first day after delivery the temperature was 100.6 F., pulse 84 and respirations 24. The patient complained of sore neck and back. The temperature rose to 101.6 F., pulse 100, respirations 24 at 10 a. m. The white blood cell count was 10,500. At noon the temperature was 102.2 F., pulse 116, respirations 24. At 2:30 p. m. a spinal puncture was done; the cell count was 65, polymorphonuclears 1, lymphocytes 64, positive Pandy test. The patient was removed to the poliomyelitis ward. At 4 o'clock the temperature rose to 103.6 F., pulse 116, respirations 30, and all other findings were inconsequential except that the patient complained of a sore neck and back which antedated to the day previous to admission to the hospital. At 10 p. m. the patient developed weakness in the right lower extremity. Kenny hot packs were started.

On the second day after delivery, October 25, the temperature fluctuated from 100.4 F. to 103 with dyspnea and gradually increasing cyanosis. At 8 a. m. there was definite paralysis of the right lower and upper extremities. At 4 p. m. the patient was very cyanotic and dyspneic; oxygen was started. At 8 o'clock complete paralysis of both lower extremities and right upper extremity was noted.

The third day after delivery, the 26th, the temperature fluctuated from 100.6 to 103 F. The patient was very nervous and cyanotic; complete hot packs to the body were applied. At 8 a. m. paralysis of both lower extremities and the right upper extremity was noted in addition to weakness of the left upper extremity. A white blood cell count at this time showed 12,200 cells. At noon, suction was started because of difficulty in swallowing (bulbar poliomyelitis signs) and by 3 p. m. the patient's color was much better and less mucus was present in the throat. At 8 o'clock an examination revealed complete paralysis of both upper and lower extremities. At 9:15 respirations became very shallow, accompanied by a weak pulse. The patient was placed in a respirator and oxygen continued by mask.

The fourth day after delivery, the 27th, the temperature fluctuated from 102.6 to 104.4 F. There was complete paralysis of both upper and lower extremities. The patient remained in the respirator, but the respirations were irregular and intermittent; during this time the patient was very listless, cold and at times irrational. A thorough examination at this time revealed no apparent clinical evidence of any complications of pregnancy. During the day suction was used frequently to remove mucus from the throat. The patient became gradually worse and died at 8:15 p. m. in the respirator. No autopsy was performed.

HISTORY OF THE CHILD

On the day of birth, Oct. 23, 1943, the child was admitted to the nursery in good condition. At 9 a. m. the child was seen by the mother for a ten minute period. No specific observation was made regarding the degree of contact between the mother and the child. The child was placed in bed beside

the mother. According to the history, this was the only contact between the mother and the child subsequent to the delivery.

The child progressed normally until the 11th day of life, November 2, when it became listless, cried seldom and at times was slightly cyanotic, showing some throat congestion. The temperature rose to 99.4 F. On the following day, the 3d, the condition of the child remained the same.

On November 4, the 13th day of life, there was noted definite weakness in both lower extremities. A spinal puncture revealed a cell count of 57, polymorphonuclear cells 12 and lymphocytes 45. The child was removed to the poliomyelitis ward.

On the 14th day of life there was inability to move the upper extremities in a normal manner.

On the 16th day of life improvement was noted in the right upper extremity, while the left upper extremity remained the same.

On November 8, the 17th day of life, both upper extremities and the left lower extremity showed improvement. The right lower extremity was completely paralyzed.

On November 20, the 29th day of life, general improvement was noted except for the right lower extremity, where there was only slight motion of the toes. There was pronounced bulging of the right side of the abdomen due to paralysis of the abdominal muscles.

On December 24, the 63d day of life, there was complete paralysis of the right lower extremity except for slight motion of the toes, with definite beginning muscular atrophy. The right abdominal muscle wall was bulging because of paralysis, requiring an abdominal binder; otherwise the child was gaining normally both mentally and physically.

This patient was a resident of the city of Wichita, in which county 164 cases of poliomyelitis occurred during the 1943 season. In the town district in which this patient resided there were 9 cases of poliomyelitis, the mother being the 7th case and the baby the 8th. The patient resided with her husband, aged 26, and 2 other children, aged 2 and 3. None of the other members of the family were ill at any time during the illness of the mother. The patient lived in an area of the town which was supplied by city water and a sewage disposal drainage system.

This infant began to show signs of poliomyelitis in its 11th day of life, which falls within the estimated period of incubation of six to twenty days as determined by Aycock and Luther.⁶

The problem arises "When was this infant exposed to the disease?" The following possibilities must be considered:

1. *Fetal Infection.*—This question has been studied thoroughly, and it is felt that failure of the disease to develop in the fetus of a mother with acute poliomyelitis is due to the low concentration of the virus in the blood stream or to its absence.⁷

2. *Birth Canal Exposure.*—Harmon,⁸ Paul and Trask,⁹ Howe and Bodian¹⁰ and numerous other workers in the poliomyelitis field have shown the presence of poliomyelitis virus in the feces of a high percentage of poliomyelitis patients during the early stages of the disease. Despite modern asepsis, contact between the mother's feces and the newborn child is possible at the time of birth.

3. *Contact Exposure.*—Four hours after birth, in accordance with practice in this hospital, the infant had a ten minute contact with the mother while the latter was in the early stage of the disease. There is no record of the intimacy of this contact, but it is possible that either buccal, nasal or rectal secretion contact may have been possible between the mother and the child.

6. Aycock, W. L., and Luther, E. H.: The Incubation Period of Poliomyelitis, *J. Prev. Med.* **3**: 103, 1929.

7. The Question of Intrauterine Poliomyelitis, editorial, *J. A. M. A.* **123**: 210 (Sept. 25) 1943.

8. Harmon, P. H., in discussion of Toomey, John A.: Active and Passive Immunity and Port of Entry in Poliomyelitis, *J. A. M. A.* **109**: 402 (Aug. 7) 1937.

9. Paul, J. R., and Trask, J. D.: The Virus of Poliomyelitis in Stools and Sewage, *J. A. M. A.* **116**: 493 (Feb. 8) 1941.

10. Howe, H. A., and Bodian, David: Untreated Human Stools as a Source of Poliomyelitis Virus, *J. Infect. Dis.* **66**: 198-201 (May-June) 1940.

4. *Other Contact Exposure.*—It has been shown by Langmuir¹¹ and by Piszczek, Shaughnessy, Zichis and Levinson¹² and others that a high percentage of contacts to cases of poliomyelitis may become carriers of the disease, especially during a time when there is a high community prevalence of the disease. Other persons who came in contact with the newborn infant may have been carriers of poliomyelitis virus.

In the absence of laboratory evidence that contacts of the child other than the mother were excreting poliomyelitis virus, it is, of course, impossible to determine the source of the infant's infection; however, it appears to us that the available evidence would suggest that infection occurred at time of birth or shortly thereafter.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

AUSTIN E. SMITH, M.D., Secretary.

SOLUTION OF EPINEPHRINE HYDROCHLORIDE (See New and Nonofficial Remedies, 1943, p. 263).

The following products have been accepted:

BURROUGHS WELLCOME & Co., INC., NEW YORK

Solution of Epinephrine Hydrochloride 1:1,000: 30 cc. bottle. Contains epinephrine hydrochloride 0.1 per cent, chlorobutanol 0.5 per cent, potassium metabisulfite 0.1 per cent and sodium chloride in isotonic solution.

Hypoloid Epinephrine Hydrochloride Injection: 1 cc. ampuls. Contains epinephrine hydrochloride 0.1 per cent, chlorobutanol 0.5 per cent, potassium metabisulfite 0.1 per cent and sodium chloride in isotonic solution.

THE WARREN-TEED PRODUCTS Co., COLUMBUS, OHIO

Sterilized Solution of Epinephrine Hydrochloride 1:1,000: 30 cc. rubber stoppered vials. Contains epinephrine hydrochloride 0.1 per cent, sodium bisulfite 0.1 per cent and chlorobutanol 0.5 per cent in isotonic solution of sodium chloride.

SUSPENSION OF EPINEPHRINE IN OIL 1:500 (See New and Nonofficial Remedies, 1943, p. 266).

The following product has been accepted:

ABBOTT LABORATORIES, NORTH CHICAGO, ILL.

Ampul Epinephrine in Oil 1:500: 1 cc. A suspension of 2 mg. of epinephrine in 1 cc. of purified peanut oil.

EPHEDRINE SULFATE (See New and Nonofficial Remedies, 1943, p. 256).

The following dosage form has been accepted:

WILLIAM R. WARNER & Co., INC., NEW YORK

Ampul Solution Ephedrine Sulfate: 50 mg. in 1 cc.

SULFATHIAZOLE (See New and Nonofficial Remedies, 1943, p. 182).

The following product has been accepted:

WILLIAM R. WARNER & Co., INC., NEW YORK

Tablets Sulfathiazole: 0.5 Gm.

CONTRACEPTIVE DIAPHRAGMS (See THE JOURNAL, Dec. 18, 1943, p. 1046).

The following product has been accepted:

JULIUS SCHMID, INC., NEW YORK

Ramses Diaphragms. Gum rubber diaphragms covering a circular spring, the external diameter varying in gradations of 5 mm. from 50 to 100 mm.

U. S. Patent 2,024,539. U. S. Trademark 284,083.

11. Langmuir, A. D.: Carriers and Abortive Cases in a Rural Poliomyelitis Outbreak, *Am. J. Pub. Health* **32**: 3 (March) 1942.

12. Piszczek, E. A.; Shaughnessy, H. J.; Zichis, Joseph, and Levinson, S. O.: Acute Anterior Poliomyelitis: Study of an Outbreak in West Suburban Cook County, *J. A. M. A.* **117**: 1926 (Dec. 6) 1941.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, JANUARY 29, 1944

DETECTING THE EXACT TIME OF OVULATION BY OVULATION POTENTIALS

Statistical studies that correlate menstruation with coitus and fertility apparently confirm the conclusion drawn from endocrine and anatomic studies that ovulation occurs in a strictly limited time in relation to subsequent menstruation. The duration of ovulation is thus indicated, according to Rock and his associates,¹ is still a matter of four or five days, during which the ovum is susceptible to fertilization for only a few hours. The uncertainty is further increased by the fact that the date of subsequent menstruation from which one may estimate ovulation time is predictable only within a wide range of several days or weeks. The importance of being able to determine the exact time of ovulation, both for conception and for contraception, is evident.

Recent studies of the problem of the so-called ovulation potentials seemed to promise a solution. In 1935 Burr, Hill and Allen detected in rabbits by means of a vacuum tube potentiometer a definite difference of potential between a suprapubic and a vaginal electrode when each ovulation occurred. Similar observations were made by Reboul, Friedgood and Davis in rabbits, by Rogers at the time of estrus in the rat and by Altmann in the hen at the time of ovulation. Burr and his associates described the same phenomenon in the human female, using an abdominovaginal circuit, and Rock and his associates obtained the same results in 10 women during the theoretical ovulation period.

Now a more careful analysis by Snodgrass, Rock and Menkin² of their results convinces them that there existed a number of discrepancies which made the value of this "abdominovaginal sign" of the time of ovulation questionable. The potential change in some cases was observed even before ovulation had occurred; there were wide variations in the magnitude,

duration and polarity of the electrical changes; erratic results were obtained when surface electrodes were employed simultaneously with an abdominovaginal circuit. Finally it was difficult to explain how the potential changes could increase in magnitude as the electrodes were moved farther away from the ovary. The observation of Rogers of a similar change in difference of potential on the last day of estrogen induced estrus in the spayed rat further increased their skepticism as to the relation between the so-called abdominovaginal sign and ovulation. In their more recent experiments Snodgrass, Rock and Menkin attempted to determine whether one could locate a point on the surface which would be stable in potential and could thus serve as the site of a reference electrode. From seventy-five to a hundred determinations of potential were made on each subject. When the potentials were sufficiently stable it was possible to construct a clearly defined series of isopotential contours. It was found that there was no demonstrable effect of sex on isopotential contours. A focus of potential could be found on the thighs in the region where the femoral artery and vein are most superficial. Potential foci could also be observed at almost any point on the abdomen, and they did not seem to have any demonstrable connection with the underlying organs. Sthenic types of individuals usually had unstable potentials. It appeared that the reason for the instability was due entirely to emotional uneasiness of the subject. Direct electrical measurements were made on human ovaries in situ on 3 women in the course of routine laparotomy. Each operation was performed within the patient's estimated ovulation time. No potentials greater than ± 1 millivolt were found between any two organs in the abdominal cavity. Several follicular surfaces, as well as the intervening ovarian cortex, were tested, but no significant electrical potential was detected. The highest potential recorded, slightly less than +2 millivolts, was obtained from a point on the rectus abdominis muscle. The authors further examined the so-called finger to finger potentials. Experiments on 30 nurses and 23 female employees of the Free Hospital for Women revealed that there is a relationship of polarity to "handedness." The authors were at a loss to explain the constancy of opposite polarity in finger potentials related to "handedness" and the theoretical influence of the ovaries.

In summarizing their experiments, Snodgrass and his associates state that the difficulty of locating on the skin surface a stable reference electrode is in itself a rational explanation for the inconsistent results previously obtained in connection with the so-called abdominovaginal sign of ovulation. The influence of temperature on the potential difference curves demonstrated a definite relation between thermal and electrical changes and indicated that the mechanism by which temperature influences potentials is concerned, at least in part, with changes in p_H . Since skin temperature

1. Rock, John; Reboul, Jean, and Snodgrass, James M.: Electrical Changes Associated with Human Ovulation, *Am. J. Obst. & Gynec.* 36: 733 (Nov.) 1938.

2. Snodgrass, James M.; Rock, John, and Menkin, Miriam F.: The Validity of "Ovulation Potentials," *Am. J. Physiol.* 140: 394 (Dec. 1) 1943.

fluctuations are known to be induced by vasomotor and endocrine changes, it seems probable that the so-called ovulation potentials previously reported, whether elicited between a vaginal and a suprapubic electrode, between two surface areas—abdominal or flank—or between fingers, are measurements only of local changes in peripheral cutaneous blood flow due to alterations in capillary tone. These authors conclude that the bioelectrical phenomena previously reported as related to ovulation are due primarily to cutaneous vascular conditions and possibly only remotely and to a slight degree to ovarian influence. Local changes in blood flow affect the focal temperature, which in turn reacts on the focal p_H , the fluctuations of which directly determine potential variations. Because the endocrine factor is only one of several affecting vascular phenomena, they believe that potential changes recorded thus far cannot be attributed solely to an ovarian activity and that therefore the electrical methods heretofore proposed are unsuitable for the detection of ovulation.

AUSTRALIAN GOVERNMENT ACCEPTS MEDICAL ADVICE

The leaders of the Australian government now admit that the administration was too hasty in its attempt to perpetrate a wholesale transformation of health services and to abolish private practice.¹ The original proposal called for a whole time salaried medical service with district organizations and an elaborate system of promotions and integration of all health services. Extensive discussion modified many phases of this plan but left it still cumbersome and bureaucratic. The interim report now states that "The committee is impressed by the existing widespread opposition to the proclamation of this act and concludes from it that the scheme there suggested is unsuitable as a permanent basis for social benefits or health services for the people of Australia."

The committee, after considering the published reports of certain of these meetings and the evidence given before it by witnesses, believes:

1. That a substantial majority of medical practitioners object to a general salaried medical service on lines laid down by the National Health and Medical Research Council or any other lines put forward up to date.

2. That, on the other hand, there is general agreement that a salaried medical service may be justified in remote areas.

3. That there is practical unanimity of opposition from all private medical witnesses to any proposal for control of any general health service by any government department; and support for control by an independent body or commission, including a majority of medical men, if such a general health service should be introduced.

4. That there are indications that a more favorable attitude toward a salaried medical service may exist among medical officers of the fighting services; but it is not possible accurately to assess the situation without consulting every member individually.

The report considers at considerable length the desirability of expansion of preventive health measures and provisions for dealing with tuberculosis and mental and venereal disease. Regarding general medical service, it is considered "that a general medical service should be instituted, as the best and most equitable means of providing medical care for the community as a whole; and that this should be financed from a central fund specifically raised for the purpose by a tax on income, having regard to the capacity of the individual to pay."

As to the methods of paying physicians, the merits and demerits of capitation, panel and fee for service plans are considered, but a definite recommendation is not made.

On methods of control and administration the report says:

While, therefore, there is pronounced opposition to the scheme outlined by the National Health and Medical Research Council which visualizes a system of governmental control of all health services, there is considerably less opposition to such a service if control is vested largely in the medical profession through an independent body with statutory authority and removed from political control. Indeed, upon this aspect of administration there is almost complete unanimity. Such freedom from political control is essential for the success of any scheme. Undoubtedly, a large section of opinion regards a full time salaried medical service as a revolutionary proposal which might seriously affect the medical profession and its services and, in fact, the existing social order. For this also they oppose it.

Still maintaining "that the ultimate solution will probably be found in a full time salaried medical service," it concludes that:

Having regard to all the circumstances and to the need for early and substantial reorganization of and improvement in health services generally as indicated therein, we consider that, subject to further discussion, . . . such services should now be planned, for introduction as and when the war situation permits, as follows:

1. *For Remote Areas* (i. e., areas which now have difficulty in maintaining one general practitioner or where difficulty is experienced in securing adequate medical services) a *Voluntary Full Time Salaried Medical Service* under a limited term appointment; with improved hospital and transport services, including extended ambulance and flying doctor services and facilities for consultant services; such services to be established and extended as necessary.

2. *For All Other Areas* (i. e., cities and country towns) a *Part Time Salaried Medical Service*, under a system of voluntary participation by general practitioners who would retain their private practices and would nominate the number of half-day sessions they would be willing to devote to a general medical service on a part time salaried basis. Such service should be provided at outpatient and consulting clinics located in the centers of population in suburban areas and country towns. Clinics would be equipped with all modern diagnostic aids and treatment facilities and would be supervised by a salaried Medical Liaison Officer responsible to the Central Health Administration. General control of the clinics would be vested in the medical personnel of each clinic.

A further suggestion proposes that the plan should be administered under a commission, a majority of whom should be nominated by the medical profession. Thus the Australian government continues to grope

1. The Parliamentary Joint Committee on Social Security: Sixth Interim Report on a Comprehensive Health Scheme, M. J. Australia 2: 41 (July 17) 1943.

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeons General of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war, and such other information and announcements as will be useful to the medical profession.

ARMY

ARMY TO TURN OVER CERTAIN CAMPS TO VETERANS' BUREAU FOR HOSPITALS

The War Department announced recently that certain army camps which have been vacated by troops sent overseas will be turned over to the Veterans' Bureau for use as Veterans' hospitals. This decision was made at a meeting called by Lieut. Gen. Brehon Somervell, commanding general, Army Service Forces, in his office and attended by Brig. Gen. Frank T. Hines, chief of the Veterans' Administration, and Major Gen. Norman T. Kirk, Surgeon General of the Army. In announcing this transfer, General Somervell said that "the War Department is determined to see that every discharged, wounded or sick veteran gets the best possible care and that this care is uninterrupted. Anything less is unthinkable. Not a single veteran of the present war should be discharged until he is entirely recovered or until the Veterans' Administration has a bed for him. The number of beds in army hospitals is of necessity limited. Adequate preparation must be made to receive wounded men from overseas for immediate treatment. General Hines desires to assume responsibility for each veteran at the earliest possible minute. We are in complete agreement on the obligation of the government to the sick or wounded soldier. However, the Veterans' Administration has been hampered by lack of facilities and of trained staffs. Therefore we offered to turn over as many camps as General Hines needs to assure uninterrupted care and comfort for our men. He accepted our offer and we now are working out details together."

General Somervell announced at the same time that, in order to prevent doctors assigned to Veterans' hospitals from resigning to join the army, all such doctors who can pass physical examinations will be commissioned in the Army Medical Corps and reassigned to the Veterans' hospitals to assist General Hines in meeting the existing acute situation in regard to all types of personnel. Which military establishments will be transferred has not yet been decided, but the War Department and Veterans' Bureau officials hope to make their decision shortly and begin preparations to receive patients as rapidly as possible.

FOUR ARMY NURSES TO RETIRE

Capt. Frances M. Steele will retire from the Army Nurse Corps on March 31 after thirty-five years of service. After her training at the Maryland General Hospital in Baltimore she served one term in the Army Nurse Corps from 1907 to 1910, then resigned and reapplied one year later, this time for thirty-two years of service. During the first world war she was with an orthopedic unit at Ellis Island, New York, and also on duty with Major Stimson in the Surgeon General's Office, Washington, D. C. She has also seen duty in Hawaii, the Philippines, Puerto Rico and the Virgin Islands. Captain Steele was formerly principal chief nurse at the William Beaumont General Hospital, El Paso, Texas.

Lieut. Col. Anna A. Montgomery, after twenty-five years of service in the Army Nurse Corps, will retire on March 31. Colonel Montgomery, in addition to service in the United States, spent four years in the Philippines and accompanied the American Relief Expedition when the United States went to the aid of Japan after the earthquake there in 1923. Colonel Montgomery was formerly in charge of the nursing service of the Seventh Service Command, Omaha.

First Lieut. Alice I. Akeley will retire from active duty in the Army Nurse Corps on March 31, after twenty-five years of service. In addition to service in the United States, she served in Hawaii and the Philippines and was sent to Japan in 1923 from Manila with the American Relief Expedition following the earthquake of that year. During the first world war she served with Base Hospital No. 59 at Rimaucourt, France. Lieutenant Akeley was formerly in charge of nurses at the Darnall General Hospital, Danville, Ky.

First Lieut. Annie L. Baird, who has served twenty-five years in the Army Nurse Corps, will retire on March 31 because of ill health. Lieutenant Baird joined the Army Nurse Corps in 1918 at Fort Myer, Virginia, served in the Army of Occupation, Coblenz, Germany, in 1920, at Schofield Barracks, Hawaii, 1925-1928, and at Sternberg General Hospital, Manila, 1932 to 1936, in addition to various posts in the United States.

CAPT. EDGAR O. HUGHES AWARDED SOLDIER'S MEDAL

Capt. Edgar O. Hughes, formerly of Washington, Ill., was awarded the Soldier's Medal for "heroism on July 5, 1943. Fifteen freight cars loaded with gasoline, bombs and other military equipment were on a railroad siding near a station. Gasoline which was being transferred to two trailers suddenly ignited, causing a tremendous explosion. Rushing to the fire, Captain Hughes and others helped combat the flames in an effort to check the possibilities of further explosions and damage. He assisted in uncoupling the eighth and ninth cars and, using the cab of the gasoline trailer as a locomotive, Captain Hughes and his companions brought eight freight cars to safety. While they were attempting to repeat the process with respect to other cars near the burning gasoline some of the bombs exploded, the concussion knocking the men to the ground. Although suffering shock and abrasions, they continued their attempts to halt the spreading flames, which had now reached the nearby dry fields. Soon after, they were removed from the scene by superior command and given medical treatment. By his unflinching devotion to duty and outstanding courage, Captain Hughes was greatly responsible for saving from complete destruction vast quantities of military equipment. His clear thinking and unusual initiative have reflected great credit upon himself and have upheld the highest traditions of the military service of the United States."

Dr. Hughes graduated from the University of Illinois College of Medicine in 1941 and entered the service Feb. 26, 1942.

REGIONAL FRACTURE-ORTHOPEDIC CONFERENCE

A regional fracture-orthopedic conference was held at the Station Hospital, Mitchel Field, New York, November 22-23, with 270 army, navy and civilian personnel in attendance. The program was set up by the Army Air Forces for the Northeastern Area. Major Stuart Z. Hawkes, chief of surgical service, Mitchel Field, was chairman. An address of welcome was delivered by Lieut. Col. Chester S. Fresh, post surgeon, after which many papers were read on numerous kinds of fractures and other related subjects. A discussion followed each of the papers presented.

PROMOTIONS IN ARMY NURSE CORPS

The War Department announced recently promotions in both the Reserve and Regular Army Nurse Corps. The three army reserve nurses to be promoted to the rank of major, in accordance with the authorization for increased grades in the nurse corps, were Major Kathleen H. Atto, Major Edna B. Groppe and Major Mary C. Walker. Major Atto, who has been consultant to Col. Florence A. Blanchfield, superintendent, Army Nurse Corps, on psychiatric nursing and public informant on nurse procurement, has been transferred to the Second Command, with headquarters at Governors Island, N. Y., to head nursing service at that headquarters. Major Groppe is on duty in the Office of the Superintendent, Army Nurse Corps, where she is in charge of nurses' assignments overseas. Major Walker was named recently to take charge of the Army's Senior Cadet Nurse Program. Other promotions of reserve nurses were 1st Lieut. Gertrude Roberts, La Junta, Colo., to the relative rank of captain; 2d Lieut. Helen A. Smathers Agronsky, Big Run, Pa., and 2d Lieut. Emily E. McMullan Norton, New York, both to the relative rank of first lieutenant.

In the Regular Army Nurse Corps Major Mary G. Phillips, executive officer to Colonel Blanchfield, Capt. L. Gertrude

Thompson, principal chief nurse at Walter Reed General Hospital, Washington, D. C., and chief nurse of the Military District of Washington, were both promoted to the relative rank of lieutenant colonel. Capt. Edith A. Aynes, now representing the Army Nurse Corps, Office of Technical Information, Surgeon General's Office, was promoted to the relative rank of major.

MEDAL OF HONOR AWARDED TO
MEDICAL AID MAN

Pfc. Frank J. Petrarca, a medical aid man in an infantry company of the 145th Infantry, 37th Division, was awarded the Medal of Honor. The citation accompanying the award reads "Even on the threshold of death, he continued to display valor and contempt for the foe; raising himself to his knees, this intrepid soldier shouted defiance at the enemy, made a last attempt to reach his wounded comrade and fell in glorious death." The Medal of Honor was presented to his mother by Major Gen. Charles L. Scott, commanding general of the Armored Command, December 23. Private Petrarca's home was in Cleveland.

NAVY

CLASS OF NAVAL MEDICAL OFFICERS

The following medical officers completed the basic course of instruction at the Naval Medical School, National Naval Medical Center, Bethesda, Md., December 27. Included are the dates and places at which these officers served their internships. All these officers at the time of the graduation were lieutenants (jg) except Dr. John D. Langston, whose rank was that of lieutenant:

Agamy, Glen Nordwin Peter, MC-V(G), USNR, U. S. Marine Hospital, New Orleans, 1942-43
Alden, Manning Wallace, (MC), USN, Garfield Memorial Hospital, Washington, D. C., 1942-43
Bloom, George Robert, MC-V(G), USNR, U. S. Marine Hospital, New Orleans, 1942-43
Buchanan, Francis Randall, MC-V(G), USNR, St. Luke's Hospital, Duluth, Minn., 1942-43
Connell, James Vincent, MC-V(G), USNR, Cooper Hospital, Camden, N. J., 1942-43
Crocker, Harvey James, MC-V(G), USNR, Beverly Hospital, Beverly, Mass., 1942-43
Cronk, Gary Arnold, MC-V(S), USNR, Syracuse University Hospital, Syracuse, N. Y., 1939-41
Davol, Rector Thomson, MC-V(G), USNR, Bellevue Hospital, New York, 1941-42
Dupler, Donald Alphoeus (MC), USN, The Graduate Hospital, University of Pennsylvania, Philadelphia, 1940-42
Gardner, Frederick Schmeerer (MC), USN, St. Luke's Hospital, Cleveland, 1939-40
Gaspar, Max Raymond (MC), USN, Los Angeles County General Hospital, Los Angeles, 1941-42
Harer, George Albert, MC-V(G), USNR, Meyer Memorial Hospital, Buffalo, 1940-41
Hinkle, Lawrence Earl, Jr., MC-V(G), USNR, Peter B. Brigham Hospital, Boston, 1942-43
Hyatt, Robert Whittaker, MC-V(G), USNR, Episcopal Hospital, Philadelphia, 1942-43
Lanier, Joe Ellis, MC-V(G), USNR, St. Vincent's Hospital, Jacksonville, Fla., 1941-42
Langston, John Donald, Lieut. (MC), USN, Jefferson Hospital, Philadelphia, 1940-42
Machles, Fannie, MC-V(G) (F), USNR, Jersey City Hospital, Jersey City, N. J., 1942-43
Morris, Stanley Frederick, MC-V(G), USNR, Greenpoint Hospital, Brooklyn, 1938-40
Mountain, David Charles, MC-V(G), USNR, Hartford Municipal Hospital, Hartford, Conn., 1941-42
Romney, Seymour L., MC-V(G), USNR, Beth Israel Hospital, Boston, 1942-43
Saraniero, Gioconda Rita, MC-V(S) (F), USNR, St. James Hospital, Newark, N. J., 1935-36
Slack, Louise Wetherill, MC-V(G) (F), USNR, Lancaster General Hospital, Lancaster, Pa., 1936-37
Smith, John Puntumey, MC-V(G), USNR, Strong Memorial Hospital, Rochester, N. Y., 1942-43
Smith, Joseph Huter II, MC-V(S), USNR, Hahnemann Hospital, Philadelphia, 1937-38
Snider, John Schurr, MC-V(S), USNR, Staten Island Hospital, Staten Island, N. Y., 1939-41
Stephenson, Robert Hilton, MC-V(S), USNR, Grady Hospital, Atlanta, Ga., 1939-40
Train, John Kirk, Jr., MC-V(S), USNR, Bellevue Hospital, New York, 1938-40
Vose, Francis Prue, MC-V(G), USNR, Rhode Island Hospital, Providence, R. I., 1942-43

NAVAL OFFICER RECEIVES
LEGION OF MERIT

The Legion of Merit has been awarded by the commander of the United States Naval Forces, Northwest African Waters, to Lieut. George M. Caldwell, formerly of White Sulphur Springs, W. Va., for exceptionally meritorious conduct as medical officer on the U. S. S. *Shubrick* during the Sicilian campaign. The citation accompanying the award read as follows:

"When the U. S. S. *Shubrick* was struck by an enemy bomb on Aug. 4, 1943 in the harbor of Palermo, Sicily, the ship was badly damaged with loss of all light and ventilation. Lieutenant Caldwell, with great coolness and professional skill, administered medical attention to the many critically wounded. His foresight and competence in preparation for handling casualties under battle conditions minimized the loss of life in this engagement.

"The extraordinary ability and outstanding devotion to duty displayed by Lieutenant Caldwell reflected great credit upon himself and the naval service."

Dr. Caldwell graduated from the University of Virginia Department of Medicine, Charlottesville, in 1935 and entered the service Sept. 21, 1942.

FIRST NAVAL MOBILE HOSPITAL
DECOMMISSIONED

The first naval mobile hospital was decommissioned at Bermuda Oct. 5, 1943, exactly three years after its official birth. Naval Mobile Hospital No. 1 sailed for Guantanamo Bay, Cuba, Oct. 25, 1940 and served at that station until July 20, 1941, when the unit, including its equipment and some prefabricated buildings, sailed for Bermuda. The hospital was open for business at the new base on Sept. 1, 1941. With the completion of a permanent dispensary at the Naval Air Station, Bermuda, the need for the mobile unit no longer existed at Bermuda, and it was decommissioned on Oct. 5, 1942. Its 19 officers and 225 enlisted men were assigned to other duties, some to mobile hospitals in other theaters.

OPERATION DONE BY FLASHLIGHT
SAVES MARINE

Lieut. Leo J. Koscinski, formerly of Chicago, was credited in a recent dispatch from Bougainville with helping to save the life of a young marine by an operation performed during the recent landing on Cape Torokina. Shrapnel had pierced the stomach, and death from internal hemorrhage seemed imminent. Because of an air raid alarm at that time, it was necessary to perform the operation, which saved the patient's life, by the light of four flashlights and under a suspended blanket. Dr. Koscinski graduated from Northwestern University School of Medicine, Chicago, in 1941 and entered the service April 14, 1942.

OPEN FIRST HOSPITAL CORPS SCHOOL FOR WOMEN

The first Hospital Corps School for enlisted members of the Women's Reserve, U. S. Naval Reserve, located at the National Naval Medical Center, Bethesda, Md., was opened on January 12. The new school has a capacity of 480 and will give a four weeks course. Since the first women were selected for corpsman duty on Jan. 22, 1943 the training has been given in small groups at seventeen different naval hospitals. With the opening of the new school, training enlisted women for Hospital Corps duty will be concentrated there. The hospitals will give three weeks of ward duty experience to graduates of the Corpsmen's School. The curriculum of the new school, which is substantially the same as for men of the Hospital Corps, will include courses in anatomy and physiology, first aid and minor surgery, hygiene and sanitation, nursing, metrology and pharmacology. When these courses plus the three weeks active ward duty are completed, graduates may be rated from hospital apprentice, second class, to pharmacist's mate, second class, depending on their abilities and experience. Two hundred and forty enlisted women are scheduled to enter the Hospital Corps School every two weeks, and an additional 60, who are already qualified by civilian experience as technicians, laboratory assistants or nurse's aides, will be sent directly from "boot camp" at the U. S. Naval Training School, the Bronx, N. Y., to the St. Albans, N. Y., or San Diego Naval Hospitals for special courses. On completion of this training they may be rated from hospital apprentice, first class, to pharmacist's mate, second class. Women Reservists are also eligible for all advance Hospital Corps training courses offered to men except those in deep sea diving, certain phases of aviation medicine and the medical

field service. These courses include clerical procedure, dental technology, operating room technic, fever therapy, physical therapy, low pressure chamber work, roentgenology, neuropsychiatry, epidemiology and sanitation, malariology and pharmacy and chemistry.

The staff of the new Corpsmen's School will be: Capt. John Harper, commanding officer; Comdr. Warren G. Wieand (MC), U.S.N., executive officer; Lieut. (jg) Ruth Roberta Mason, U.S.N.R., disbursing officer; Lieut. (jg) Clarence W. Ferguson, Hospital Corps, U.S.N., personnel officer; Lieut. (jg) Clara Alice Stolp, Nurse Corps, U.S.N., chief nursing instructor; chief pharmacist Eugene P. Campbell, U.S.N., chief instructor.

LIEUT. COMDR. JAMES F. STANDARD AWARDED SILVER STAR MEDAL

The Silver Star Medal was recently awarded to Lieut. Comdr. James F. Standard "for conspicuous gallantry and intrepidity in action against the enemy while serving with a Marine aircraft wing on Guadalcanal Island on the night of Oct. 13-14, 1942. During the vicious night attack against our positions on the island by enemy naval units, which commenced an unprecedented shelling together with sporadic bombings, Lieutenant Standard, with complete disregard for his own safety, proceeded to the sick bay and then led an ambulance through the shelled area to assist in giving aid to the wounded. His courageous conduct was in keeping with the highest traditions of the United States Naval Service." Dr. Standard graduated from Washington University School of Medicine, St. Louis, in 1936 and entered the service on Feb. 10, 1941. He is now serving on active duty for the second time somewhere in the South Pacific.

MISCELLANEOUS

BOOKS FOR HOSPITALIZED SOLDIERS

Margaret Willis
Hospital Librarian

JEFFERSON BARRACKS, MO.

Books, more than anything else, are today influencing the thoughts and feelings of soldiers confined to army hospitals. Frankly, as librarian at Jefferson Barracks, basic training center No. 1 of the AAF Training Command, I am amazed at the serious interest of many soldiers in the more profound books. The soldiers do not hesitate to express their delight when they find such books in the library and their chagrin if they do not. Requests come in daily for the philosophy of Santayana, Spinoza, Plato, Aristotle, Nietzsche, Schopenhauer, John Dewey, Thorstein Veblen, Karl Marx and Lin Yutang as well as of Jefferson, Lincoln and Walt Whitman. These soldiers seem deeply concerned with what outstanding writers have thought about life, its meaning and spiritual possibilities.

"Bed patients" read constantly because they can do nothing else. To these boys a book to their liking is a vacation from monotonous surroundings. While reading the special book they have chosen they forget themselves—a basic requisite in the building of morale. As an influence of modern thought, good recreational reading should not be dismissed too lightly. Not all important ideas are stated directly in so many words. "For Whom the Bell Tolls" or "So Little Time" say a great deal about our times indirectly. Hospitalized soldiers discover in "Grapes of Wrath," "Native Son," "Brothers Under the Skin" and "A Tree Grows in Brooklyn" the problems of the other fellow. As a result, through their better understanding of the needs of all classes and races, soldiers will be more inclined to contribute to the coming peace rather than to hinder it.

THIRTY-EIGHT A. M. A. EMPLOYEES NOW IN THE ARMED FORCES

Up to the present time thirty-eight employees of the American Medical Association have entered the armed forces of the United States, ten of whom are now overseas. One of them, Master Sergt. John A. Kovacs, member of the staff of the Council on Pharmacy and Chemistry before going into the army, has been awarded the Legion of Merit (*THE JOURNAL*, Dec. 18, 1943, p. 1054). The assistant editor of *THE JOURNAL*, Lieut. Col. J. F. Hammond, a retired regular army officer who has been with the Association since 1922, was called to active duty on Nov. 9, 1942 as a member of a permanent Court Martial in the Sixth Service Command, serving in that capacity until about Sept. 1, 1943, when he was appointed editor of the *Bulletin of the U. S. Army Medical Department*, Washington, D. C. A list of the other employees, together with the last known address, is given under the respective branch with which they are serving:

ARMY

- Pvt. Harry Amici, 2d Med. Sup. Depot, 1st Advance Section, U. S. Army, APO 302, % Postmaster, New York.
- Pvt. Victor Amici, Station Hospital Med. Det., Camp Chaffee, Ark.
- S/Sgt. Marshall B. Barry, 46th Depot Repair Squadron, APO 635, % Postmaster, New York.
- Pfc. Arthur Bierwirth, 448 Bomb. Gp. Squadron 712, Wendover Field, Utah.
- Capt. William B. Bradley, A. C., 24th Altitude Training Unit, Selman Field, Monroe, La.
- Pvt. James A. Dale, Med. Det. 322 Inf., APO 81, Camp San Luis Obispo, Calif.
- Pvt. Gus Christodolos, 744 W. North Avenue, Chicago.
- Cpl. Fred Grabenhofer, 490 Engineers Equipment Company, APO 4580, % Postmaster, San Francisco.
- Pvt. George E. Hall Jr., Barracks 2427, 2d Platoon, Troop N, 2d Regt., C. R. T. C., Fort Riley, Kansas.
- Lieut. Col. J. F. Hammond, Surgeon General's Office, Washington, D. C.
- Pfc. Robert Jaeger, Wagon Co. 1624-S. U., Camp Ellis, Ill.
- Pvt. Thomas Judge, Co. D, 728 M. P. Bn., Camp River Rouge Park, Detroit.
- Capt. Harold D. Kautz, M. C., 67th Station Hospital, APO 606 % Postmaster, Miami, Fla.
- Pvt. Frank Konieczny, Service Btry, 83 F. A. Bn., Fort Sill, Oklahoma.

M/Sgt. John A. Kovacs, Medical Section, N. A. T. O., U. S. Army, APO 534, % Postmaster, New York.

Pfc. Fred. H. Lech, APO 4937, % Postmaster, New York.

Pfc. Arthur McCurdy, 476 Flex. Gun. Train. Squadron, Harlingen Army Air Field, Harlingen, Texas.

Pfc. Charles Moose, Gunnery Sqd. #6 Class 44-5 Y. A. A. F., Yuma, Arizona.

Pfc. George Olsen, 69th Signal Bn., Co. C, Camp McKin, Grenada, Miss.

Cpl. Leo S. Parenti, APO 7488, % Postmaster, New York.

Pvt. Walter Pomianek, Brooks General Hospital, Ward 36, Fort Sam Houston, Texas.

Cpl. Barney Taylor, 46th Fighter Squadron, A. A. F., APO 459, % Postmaster, San Francisco.

Pvt. Russell Tipps, Crystal Lake, Ill.

Capt. Irwin C. Winter, M. C., Station Hospital, Flexible Gunnery School, Buckingham Air Field, Fort Myers, Florida.

MARINES

Pfc. Edward Barleak, U. S. M. C. Special Weapon Group, 8th Defense Bn., F. M. F., % Fleet Post Office, San Francisco.

Edward Ciesla, 3643 W. School St., Chicago.

Cpl. Henry Ford, Hq. and Service Btry., Anti Aircraft Gp. B. 6th Defense Btn., Navy No. 1504, % Fleet P. O. San Francisco.

John W. E. Krautter, PhMz, 25th Replacement Bn., % Fleet Post Office, San Francisco.

NAVY

Henry H. Dohrn, A. S., Co. H., U. S. N. R., Navy V, 12 Unit, G. A. College, St. Peter, Minn.

Lieut. (jg) Charles E. Nyberg, Amphibious Training Command, N. O. B., Norfolk, Va.

Erwin Putzler, U. S. Naval Training Station, Great Lakes, Ill.

WACS

Cpl. Zona Davis, Hqs. Southwest Asia Command, APO 432, % Postmaster, New York.

Lieut. Frances Dowd, Station Hospital, Daytona Beach, Fla.

Capt. Helen Lloyd-Jones, 1550 S. U., Fort Knox, Kentucky.

Lieut. Mildred Patton, Camp Roberts, Calif.

Cpl. Zola C. Wist, The Collingwood, 45 West 35th St., New York 1.

SPARS

Angela Y. Duda, A. S., Co. 111-8-Rm. 534, Y. S. C. G. T. S., Palm Beach, Fla.

Mary Meyer, Spars Hqs., Miami Beach, Fla.

Two other A. M. A. employees have temporarily left the Association to fill specialized positions for the government for the duration. Miss Lois Stice, news editor of THE JOURNAL, is in the Office of Civilian Defense, Washington, D. C. Dr. Paul C. Barton, director of the Bureau of Investigation at these headquarters, is assistant executive officer of the Procurement and Assignment Service.

AMERICAN RED CROSS WORK IN 1943

Last year the American Red Cross experienced its busiest year in history. This organization served the armed forces abroad and at home, on the war front and in training camps, as well as civilians in many parts of the world. Industry, agriculture, other organizations and associations, as well as the individual American, enabled the Red Cross to carry on its important work.

During 1943 the American Red Cross shipped 7,405,088 food parcels to prisoners of war, weighing 8 pounds each and consisting of processed meats, cheese, powdered milk, fats and butter substitutes, dried fruits, orange concentrate, biscuits, chocolate bars, jam, dehydrated soup, hard candy, sugar, powdered coffee, soap, smoking tobacco and cigarettes.

Manufacturers of drugs contributed to the success of Red Cross activities by providing the standard remedies and first aid materials used to compose the 13,000 medicine chests sent to the International Red Cross committee for distribution to prisoners of war. These chests contained standard products such as acetylsalicylic acid, soda, disinfectants, ointments, bandages, tape and cotton. The textile industry provided the necessary gauze which enabled several million volunteers to make more than 900,000,000 surgical dressings during the year. The container industry provided the cans and cartons for the individual products, as well as the fiber containers making up the complete package. This industry also provided the tin and fiber containers used in packing the 4,300,000 blood plasma units. Other branches of American industry also aided the Red Cross in supplying glass containers in which the powdered plasma and distilled water composing the unit are packed, as well as needles and tubing used in mixing the plasma with the water and administering the transfusion.

WARTIME GRADUATE MEDICAL MEETINGS

Among the subjects scheduled for early presentation under the auspices of the Wartime Graduate Medical Meetings are the following at Fort Monmouth, N. J.: Physiologic and Pathologic Background of Arthritis; Clinical Discussions and Question and Answer Period, Dr. C. W. Scull, Dr. T. F. Bach and Capt. A. R. Reynolds, February 2; Rheumatic Heart Disease, Dr. Thomas McMillan, Capt. Solomon J. Selikoff, February 9; Pathogenesis of Malaria, Dr. William Sawitz and Capt. Gerald W. Smith, February 16.

At Naval Hospital, Pa.: Obstructive Lesions of the Urinary Tract and Their Relationship in the Production of Renal Pathology, Dr. Joseph C. Birdsall, February 4.

The following program will be presented at the Wartime Graduate Medical Meetings at Percy Jones General Hospital, Battle Creek, Mich., February 14: Allergy Principles as Seen in Percy Jones General Hospital, Major Ralph I. Alford; Malaria, Its Incidence and Management, Capt. Robley D. Bates Jr.; General Consideration of Peptic Ulcer, Capt. James M. MacMillan; Some Side Lights on Soldiers with Arthritis, Major Clarence B. Whims; Presentation of Dermatologic Cases, Capt. Allen W. Pepple; Rheumatic Fever in an Army General Hospital, Major John B. McKee; Unusual Causes for Diarrhea, Lieut. Col. Charles M. Caravati; Coccidioidomycosis, Major William H. Wood Jr.; Neuropsychiatric Aspects of Fear and Its Derivatives, Lieut. Col. Paul A. Petree.

On February 21 the following program will be presented at the Wartime Graduate Medical Meetings at Percy Jones General Hospital: Amputations, Lieut. Col. Francis M. McKeever; Prostheses, Capt. Ronald M. Buck; Sciatica, Major Frank R. Mayfield; Empyema, Major Earle B. Kay; Plastic Surgery, Major Preston C. Iverson; Traumatic Perforations of Ear Drum, Lieut. Col. Charles W. Barkhorn; Penicillin in Surgery, Capt. Jose M. Ferrer Jr.; Penicillin in Gonorrhea, Major Ross M. Newman. Both meetings will be addressed by Brig. Gen. J. E. Bastion.

CASUALTIES OF U. S. ARMED FORCES SINCE OUTBREAK OF WAR

The Office of War Information reported on January 15 the number of casualties of the United States armed forces from the outbreak of the war. This total, combining the latest available War and Navy Department reports, includes 32,078 dead, 45,595 wounded, 32,478 missing and 29,707 prisoners of war. Of these 1,619 have died in prison camps, mostly in Japanese occupied territory.

The War Department report (as of Dec. 23, 1943) lists army casualties totaling 105,229. Of this number 16,831 were killed and 38,916 wounded. There were 24,067 missing and 25,415 prisoners of war. Of the wounded 20,036 have returned to active duty or have been released from the hospital. The casualties include 12,500 Philippine Scouts; of these 469 were killed and 747 wounded; the remainder are assumed to be prisoners of war.

The Navy Department (as of Jan. 14, 1944) shows casualties whose next of kin have been notified totaling 34,629, made up of 15,247 dead, 6,679 wounded, 8,411 missing and 4,292 prisoners of war.

HOSPITALS NEEDING INTERNS AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their house staff quotas allotted by the Procurement and Assignment Service:

(Continuation of list in THE JOURNAL, January 22, p. 238)

MASSACHUSETTS

Springfield Hospital, Springfield. Capacity, 285; admissions, 6,996. Dr. Eugene Walker, Superintendent (1 intern).

WISCONSIN

Milwaukee Hospital, Milwaukee. Capacity, 359; admissions, 8,472. Rev. William G. Sadt, Administrator (interns).

ORGANIZATION SECTION

A MESSAGE TO THE MEMBERS OF THE AMERICAN MEDICAL ASSOCIATION

For some ten years the physicians of the United States have been subjected to a series of stresses such as have disturbed the orderly progress of medical science in no previous period of similar length. In 1860 Oliver Wendell Holmes wrote:

"The truth is that medicine, professedly founded on observation, is as sensitive to outside influences, political, religious, philosophical, imaginative, as is the barometer to the changes of atmospheric density."

The depression of 1929, the evolution of the Social Security Act, the first Wagner bill, the development of hospitalization and medical care insurance, the enrolment of a third of the active medical profession in the armed forces, and now the Wagner-Murray-Dingell bill represent a series of provocative crises. Each of these challenges was met by the House of Delegates, the Trustees and the officers of the Association with clearly defined statements of policy which the Association has disseminated widely. Under these policies the extension of medical service has proceeded steadily and everything possible has been done to maintain the quality of medical education and medical service at the high standard that has been our ideal. The continued pressure of the years has been climaxed by the Beveridge report, the report of the National Resources Planning Board and the introduction of the Wagner-Murray-Dingell bill. This comes when every physician not in the armed forces is giving of himself unstintedly without thought of time or physical capacity.

Today strange social philosophies pervade the radio, the press and the periodicals. Panaceas for medical problems are proffered by innumerable prescribers. Some preach distrust of medical organization, cast doubt on the loyalty of our leaders, sow dissension in our membership! These activities are no doubt a reflection of anxieties and fears. And they appear at a time when a united, loyal, solidly organized medical profession is more needed than at any previous time in our history! When our representatives appear before legislative hearings they are entitled to the loyal, enthusiastic, unified support of the constituent and component societies of the American Medical Association.

In some areas there are attempts at reorganization of the county medical society on a strictly business basis; attempts are being made to organize small groups of the states into sectional cliques; before the House of Delegates of one state a delegate actually urged a united opposition to the Southern states; here and there physicians, apparently inspired by lay employees or by the urging of outside agencies, would pour the funds of county and state medical societies,

swollen by special assessments, into "public relations," as if this were some new and potent magic; there are occasional demands that the medical profession "unionize" and affiliate with one or the other of the major labor organizations. The far-seeing Oliver Wendell Holmes was right: physicians are "sensitive to outside influences, political, religious, philosophical, imaginative."

Now what are the facts? The trend of public thought is quite definitely against any such expansion of the Social Security Act as the Wagner-Murray-Dingell bill contemplates. The Council on Medical Service and Public Relations has been organized, has developed a program, has stated its policies, has secured a full time secretary, has expanded sources of information on legislative activities, is participating in public relations for the Association. The Board of Trustees has organized for suitable representation at any hearings that may be called on legislation affecting the medical profession. The publications of the Association have reached the highest peak in their history in circulation and effectiveness. A poll proves that a majority of Americans interviewed consider the American Medical Association an organization interested in the advancement of medical science, an organization devoted to the approval of that in medicine which is sound and exposing that which is fraudulent—what the experts call a "favorable symbol." And all this accomplished at a time when the employees of the Association have been reduced by one fourth by war activities or call to the armed forces, and when many others are likewise giving largely of their time to war activities.

The Board of Trustees pledges itself anew, as do the officers and employees of the Association, to do their utmost to carry out and to implement the principles, the policies and the mandates of the House of Delegates. To some 55,000 physicians who are in the armed forces the Board pledges all that the Association can do to maintain for them a medical profession free from the interference of political control. The Board is convinced that the House of Delegates will also do its utmost to hold the traditions of Americanism and American medicine inviolate until the physicians who are now with the armed forces return and themselves participate in determining the future of American medicine.

BOARD OF TRUSTEES:

Roger I. Lee, M.D., Chairman	
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THE PHYSICIAN'S FEDERAL INCOME AND VICTORY TAX

PREPARED BY THE BUREAU OF LEGAL MEDICINE AND LEGISLATION

Federal income and victory taxpayers, last September, filed a declaration of estimated tax covering the calendar year 1943. This was the second step to put taxpayers on a current payment basis, the first step having been taken when the withholding provisions of the current tax payment act became operative on July 1, 1943. In this declaration, estimates of income and deductible expenses were made and taxes were computed on these estimates. The tax estimated to be due was either paid in full at the time the declaration was filed or one half then and the remainder on or before December 15. Persons in the armed forces on September 15 were excused from then filing the declaration.

FINAL RETURN FOR 1943

On or before March 15, a final return for 1943 must be filed. This return, in effect, will be in substantiation of the declaration that was filed in September. It will be based on the provisions of the revenue act of 1942 and of the current tax payment act of 1943. The new revenue bill now pending in Congress need not be given any consideration in filing the return. The purpose of the final return is to place the taxpayer on an actual tax basis instead of an estimated tax basis to permit readjustments. If the taxpayer has already paid more during 1943 than his final return would be filed on or before March 15 indicates he should have paid, he will be entitled to a refund or credit. If he paid less, then he will be required to pay the difference.

TAX FORGIVENESS

In connection with this return, consideration must be given to the tax forgiveness provisions of the current tax payment act of last year. That act provided for an abatement of 75 per cent of one year's tax, or the first \$50 thereof, whichever amount is the greater. The abatement is based on the lower tax of the two years 1942 and 1943 except in the case of taxpayers in service. If the 1943 tax is lower, 75 per cent of it is abated. If the 1942 tax is lower as shown on the return that was filed last March, 75 per cent of it is abated. The unabated portion will become a liability on March 15 of this year. The taxpayer may either pay the unabated portion in full at that time or he may pay one half of it at that time and the remainder on or before March 15, 1945.

If a taxpayer was in the armed forces at any time during the taxable year of 1942 or 1943, and his tax for 1942 was greater than the tax for 1943, the forgiveness will be increased to the extent that the excess of the 1942 tax over the 1943 tax is attributable to the inclusion of net income. A detailed explanation of this special provision in favor of persons in the service was included in *THE JOURNAL*, Aug. 14, 1943, page 1134. Physicians in service should review that explanation.

THE VICTORY TAX

The method of computing the victory tax was explained in *THE JOURNAL*, Aug. 14, 1943. There has been one modification of the method of computation made effective since that time. Initially the revenue act conditioned the option that was accorded a taxpayer

to take credit currently for the postwar credit on his having paid premiums on life insurance, purchased obligations of the United States or reduced indebtedness in an amount equal to the credit allowed. By Public Law No. 178, Seventy-Eighth Congress, approved Oct. 28, 1943, the postwar credit provisions of the revenue act were repealed and the taxpayer allowed an unconditional current credit against the victory tax as follows:

1. *Single Persons*.—In the case of a single person, a married person not living with husband or wife, or an estate or trust, an amount equal to 25 per cent of the victory tax or \$500, whichever is the lesser.

2. *Heads of Families*.—In the case of the head of a family, an amount equal to 40 per cent of the victory tax or \$1,000, whichever is the lesser.

3. *Married Persons*.—In the case of a married person living with husband or wife—

(a) if separate returns are filed by each spouse an amount equal to 40 per cent of the victory tax or \$500, whichever is the lesser, or

(b) if a separate return is filed by one spouse and no return is filed by the other spouse, or if a joint return is filed, only one credit not exceeding 40 per cent of the victory tax or \$1,000, whichever is the lesser.

4. *Dependents*.—For each dependent, excluding as a dependent in the case of the head of a family one who would be excluded for income tax purposes, an amount equal to 2 per cent of the victory tax or \$100, whichever is the lesser.

If the status of the taxpayer changed during the year with respect to his marital relationship or with respect to his dependents, other than a taxpayer who uses the simplified return form, the amount of the credit will be apportioned, under rules and regulations prescribed by the Commissioner of Internal Revenue with the approval of the Secretary of the Treasury, in accordance with the number of months before and after such change. For the purpose of such apportionment, a fractional part of a month will be disregarded unless it amounts to more than half a month, in which case it will be considered as a month.

EXEMPTIONS

The revenue act of 1942 under which the final return will be filed reduced the personal exemption of single persons from \$750 to \$500 and of married persons or heads of families from \$1,500 to \$1,200. It also reduced the credits for dependents from \$400 to \$350. The current tax payment act of 1943 provides a special exemption for members of the armed forces, in addition to the personal exemption. The first \$1,500 of the service pay of members of the armed forces, including commissioned officers, is nontaxable.

TAX RATES

The basic rate of taxation remains at 6 per cent. The surtax rate begins at 13 per cent on the first \$2,000 of surtax net income and increases in rate for incomes in the higher brackets. The earned income credit of

10 per cent remains as heretofore, claimable in connection with the normal tax but not with the surtax. The pending tax bill proposes to eliminate this credit, applicable to 1944 income.

SIMPLIFIED TAX SCHEDULE

The provision for a simplified tax schedule for use by taxpayers having gross incomes of \$3,000 or less, derived wholly from salaries, wages or other forms of compensation for personal services, dividends, interest, rents, annuities or royalties is continued. The use of the simplified form is optional. Generally speaking, if a taxpayer has no deductions it will be to his advantage to use this form.

WHO MUST FILE RETURNS

In General.—1. Returns must be filed by every unmarried person and by every married person not living with spouse, if gross income during 1943 was \$500 or more.

2. Returns must be filed by every married person who lived with spouse, if gross income during 1943 was \$1,200 or over. If both husband and wife had income and their combined gross income was \$1,200 or over, they must either file separate returns or, if both are citizens or residents of the United States and if they were living together at the end of the taxable year, they may file a joint return. If a person was married and lived with spouse for only part of 1943, special rules apply with respect to the filing of returns, and physicians who come within this classification should read carefully the instructions given on the tax return blanks.

If the status of a taxpayer, so far as it affects the personal exemption or credit for dependents, changed during the year, the personal exemption and credit must be apportioned, under rules and regulations prescribed by the Commissioner of Internal Revenue with the approval of the Secretary of the Treasury, in accordance with the number of months before and after such change. For the purpose of such apportionment a fractional part of a month should be disregarded unless it amounts to more than half a month, in which case it is to be considered as a month.

Physicians in Military and Naval Service.—While a physician in the armed forces was not required to file a declaration of estimated income last September, the fact of service does not of itself excuse a failure to file the return next March. It is understood that if because of the inaccessibility of necessary records a physician in service is unable to file a complete return, he may file a tentative return on which he must estimate his income, deductions and tax as best he can and indicate on the return his reasons for following this procedure. At a later date, if that procedure is followed, a completed return must be filed and necessary adjustments in tax will be made. What has just been said relates to physicians in service who are stationed in this country.

If a physician in service is on duty outside the United States, no income tax return or payment of income tax will become due, generally speaking, until the 15th day of the 4th month following the month in which the physician ceases, except by reason of death or incompetency, to be a member of the military forces on sea duty or in service outside the continental United States, or the 15th day of the third month following the month in which the present war is terminated, whichever may be the earlier.

GROSS AND NET INCOMES: WHAT THEY ARE

Gross Income.—A physician's gross income is the total amount of money received by him during the year for professional services, regardless of the time when the services were rendered for which the money was paid, assuming that the return is made on a cash receipts and disbursements basis, plus such money as he has received as profits from investments and speculation and as compensation and profits from other sources.

If a physician receives a salary as compensation for services rendered and in addition thereto living quarters or meals, the value to the physician of the quarters and meals so furnished ordinarily constitutes income subject to tax. If, however, living quarters or meals are furnished for the convenience of the employer, the value thereof need not be computed and added to the compensation otherwise received by the physician. As a general rule, the test of "convenience of the employer" is satisfied if living quarters or meals are furnished to a physician who is required to accept such quarters and meals in order to perform properly his duties. For example, if a physician employed by a hospital is subject to immediate service at any time during the twenty-four hours of the day and therefore cannot obtain quarters or meals elsewhere without material interference with his duties and on that account is required by the hospital to accept the quarters or meals furnished by it, the value thereof need not be included in the gross income of the physician.

Net Income.—Certain professional expenses and the expenses of carrying on any enterprise in which the physician may be engaged for gain may be subtracted as "deductions" from the gross income, to determine the net income on which the tax is to be paid. An "exemption" is allowed, the amount depending on the taxpayer's marital status during the tax year as stated before. These matters are fully covered in the instructions on the tax return blanks.

Earned Income.—In computing the normal tax, but not the surtax, there may be subtracted from net income from all sources an amount equal to 10 per cent of the earned net income, except that the amount so subtracted shall in no case exceed 10 per cent of the net income from all sources. Earned income means professional fees, salaries and wages received as compensation for personal services, as distinguished from receipts from other sources.

The first \$3,000 of a physician's net income from all sources may be regarded under the law as earned net income, whether it was or was not in fact earned within the meaning set forth in the preceding paragraph. Net income in excess of \$3,000 may not be claimed as earned unless it in fact comes within that category. No physician may claim as earned net income any income in excess of \$14,000.

PHYSICIANS IN MILITARY OR NAVAL SERVICE

Physicians in service are as much subject to the income tax law as are physicians engaged in civilian practice, except when expressly excluded from a requirement. The service pay of such physicians must be reported as income. Commutation of quarters and rental value of quarters occupied by medical officers, however, are not taxable income.

If the ability of physicians in service to pay income taxes is materially affected by such service, payment of the tax falling due before or during the service may be deferred for a period extending not more than six

months after termination of service. This deferment is authorized by section 513 of the Soldiers' and Sailors' Civil Relief Act of 1940 and applies to all members of the Army, Navy, Marine Corps and Coast Guard, and to all officers of the United States Public Health Service detailed by proper authority for duty either with the Army or Navy, on active duty or undergoing training or education under the supervision of the United States preliminary to induction into service. This does not apply to the tax imposed on employers by section 1400 of the Federal Insurance Contributions Act. This deferment is not automatic. The taxpayer must present evidence to show that his ability to pay the tax is materially impaired by reason of military service. Proof of that impairment should be submitted at the time the tax is due, on a form procurable from the offices of the collectors of internal revenue. A copy of the form was reproduced in the Feb. 28, 1942 issue of THE JOURNAL on page 737.

Any tax liability owed by a member of the military or naval forces who dies in service will be canceled, this relief being retroactive to Dec. 7, 1941. If a tax has already been assessed at the time of the death of a person in service it will be abated. If the tax has already been collected, it will be refunded as an overpayment. This tax forgiveness applies only to income taxes and not to the estate tax.

DEDUCTIONS FOR PROFESSIONAL EXPENSES

A physician is entitled to deduct all current expenses necessary in carrying on his practice. The taxpayer could make no claim for the deduction of expenses unless he is prepared to prove the expenditure by competent evidence. So far as practicable, accurate itemized records should be kept of expenses and substantiating evidence should be carefully preserved. The following statement shows what such deductible expenses are and how they are to be computed:

Office Rent.—Office rent is deductible. If a physician rents an office for professional purposes alone, the entire rent may be deducted. If he rents a building or apartment for use as a residence as well as for office purposes, he may deduct a part of the rental fairly proportionate to the amount of space used for professional purposes. If the physician occasionally sees a patient in such dwelling house or apartment, he may not, however, deduct any part of the rent of such house or apartment as professional expense; to entitle him to such a deduction he must have an office there, with regular office hours. If a physician owns the building in which his office is located, he cannot charge himself with "rent" and deduct the amount so charged.

Office Maintenance.—Expenditures for office maintenance, as for heating, lighting, telephone service and the services of attendants are deductible.

Supplies.—Payments for supplies for professional use are deductible. Supplies may be fairly described as articles consumed in the using; for instance, dressings, clinical thermometers, drugs and chemicals. Professional journals may be classified as supplies and the subscription price deducted. Amounts currently expended for books, furniture and professional instruments and equipment, "the useful life of which is short," generally less than one year, may be deducted, but if such articles have a more or less permanent value, their purchase price is a capital expenditure and is not deductible.

Equipment.—Equipment comprises property of a more or less permanent nature. It may ultimately wear out, deteriorate or become obsolete, but it is not in the ordinary sense of the word "consumed in the using."

The cost of equipment such as has been described, for professional use, cannot be deducted as expense in the year acquired. Examples of this class of property are automobiles, office furniture, medical, surgical and laboratory equipment of more or less permanent nature, and instruments and appliances constituting a part of the physician's professional outfit, to be used over a considerable period of time, generally over one year. Books of more or less permanent nature are regarded as equipment and the purchase price is therefore not deductible.

Although the cost of such equipment is not deductible in the year acquired, nevertheless it may be recovered through depreciation deductions taken year by year over its useful life, as described later.

No hard and fast rule can be laid down as to what part of the cost of equipment is deductible each year as depreciation. The amount depends to some extent on the nature of the property and on the extent and character of its use. The length of its useful life should be the primary consideration. The most that can be done is to suggest certain average or normal rates of depreciation for each of several classes of articles and to leave to the taxpayer the modification of the suggested rates as the circumstances of his particular case may dictate. As fair, normal or average rates of depreciation, the following have been suggested: automobiles, 25 per cent a year; ordinary medical libraries, x-ray equipment, physical therapy equipment, electrical sterilizers, surgical instruments and diagnostic apparatus, 10 per cent a year; office furniture, 5 per cent a year.

The principle governing the determination of all rates of depreciation is that the total amount claimed by the taxpayer as depreciation during the life of the article, plus the salvage value of the article at the end of its useful life, shall not be greater than its purchase price or, if purchased before March 1913, either its fair market value as of that date or its original cost, whichever may be greater. The physician must in good faith use his best judgment and claim only such allowance for depreciation as the facts justify. The estimate of useful life, on which the rate of depreciation is based, should be carefully considered in his individual case.

Medical Dues.—Dues paid to societies of a strictly professional character are deductible. Dues paid to social organizations, even though their membership is limited to physicians, are personal expenses and not deductible.

Postgraduate Study.—The Commissioner of Internal Revenue holds that the expense of postgraduate study is not deductible.

Traveling Expenses.—Traveling expenses, including amounts paid for transportation, meals and lodging, necessarily incurred in professional visits to patients and in attending medical meetings for a professional purpose, are deductible.

Automobiles.—Payment for an automobile is a payment for permanent equipment and is not deductible. The cost of operation and repair, and loss through depreciation, are deductible. The cost of operation and repair includes the cost of gasoline, oil, tires, insurance, repairs, garage rental (when the garage is not owned by the physician), chauffeur's wages, and the like.

Deductible loss through depreciation of an automobile is the actual diminution in value resulting from obsolescence and use and from accidental injury against which the physician is not insured. If depreciation is computed on the basis of the average loss during a series of years, the series must extend over the entire estimated life of the car, not merely over the period in which the car is possessed by the present taxpayer.

If an automobile is used for professional and also for personal purposes—as when used by the physician partly for recreation, or so used by his family—only so much of the expense as arises out of the use for professional purposes may be deducted. A physician doing an exclusive office practice and using his car merely to go to and from his office cannot deduct depreciation or operating expenses; he is regarded as using his car for his personal convenience and not as a means of gaining a livelihood. What has been said in respect to automobiles applies with equal force to horses and vehicles and the equipment incident to their use.

MISCELLANEOUS

Contributions to Charitable Organizations.—For detailed information with respect to the deductibility of charitable contributions generally, physicians should consult the official return blank or obtain information from the collectors of internal revenue or from other reliable sources. A physician may not, however, deduct as a charitable contribution the value of services rendered an organization operated for charitable purposes.

Bad Debts.—Physicians who make their returns on a cash receipts and disbursements basis, as most physicians do, cannot claim deductions for bad debts.

Taxes.—Taxes generally, either federal or state, are deductible by the person on whom they are imposed by law. Both real and personal property taxes are deductible; but so-called taxes, more properly assessments, paid for local benefits, such as street, sidewalk, and other like improvements, imposed because of and measured by some benefit inuring directly to the property against which the assessment is levied, do not constitute an allowable deduction from gross income. Physicians may deduct state gasoline taxes and state sales taxes. In some states sales taxes are imposed on the seller, but, if they are passed on to the buyer, the latter may deduct them.

State income and use taxes are deductible; federal income taxes are not. Among the federal taxes that a physician may deduct are those on admissions, dues, initiation fees, safety deposit boxes, tax on telegraph, telephone, cable and radio messages, and the federal use tax on automobiles. State automobile license fees are deductible. If a state or local fee is imposed for regulatory purposes, and not to raise revenue, the fee may not ordinarily be deducted as a tax. If such fees, however, are classifiable as a business expense, they are deductible as such. Annual registration fees imposed on physicians probably come within the category of regulatory fees and should be deducted as a business expense rather than as taxes. Local and state occupational taxes imposed on physicians are deductible either as taxes or as a business expense, depending on the purpose for which the tax is imposed.

The excise taxes imposed on employers by section 804, title VIII, and section 901, title IX, of the Social Security Act, commonly referred to as old age and unemployment benefit taxes, are deductible annually by employers in computing net income for federal income tax purposes. If the taxpayer's return is made on a

cash basis, as are the returns of practically all physicians, the taxes are deductible for the year in which they are actually paid. If the return is made on an accrual basis, the taxes are deductible for the year in which they accrue, irrespective of when they are actually paid. Employees, including physicians whose employment brings them within that category, may not deduct the tax imposed on them by section 801, title VIII, of the Social Security Act, generally referred to as the old age benefits tax. If, however, the employer assumes payment of the employee's tax and does not withhold the amount of the tax from the employee's wages, the amount of the tax so assumed may be deducted by the employer, not as a tax paid but as an ordinary business expense.

Medical Expense.—A taxpayer may deduct amounts expended for medical, dental and hospital care, not compensated for by insurance or otherwise, including amounts paid for accident and health insurance, according to a prescribed formula. Deductions will be permitted to the extent that such expenses exceed 5 per cent of the net income of the taxpayer but not in excess of \$2,500 in case of the head of a family, or \$1,250 in case of other individual taxpayers.

Equipment Necessitated by Military Service.—The cost of equipment of an Army officer to the extent only that it is especially required for his profession and does not merely take the place of articles required in civilian life is deductible. The cost of a uniform is considered a personal expense and hence not deductible.

Laboratory Expenses.—The deductibility of the expenses of establishing and maintaining laboratories is determined by the same principles that determine the deductibility of corresponding professional expenses. Laboratory rental and the expenses of laboratory equipment and supplies and of laboratory assistants are deductible when under corresponding circumstances they would be deductible if they related to a physician's office.

Losses by Fire or Other Causes.—Loss of and damage to a physician's equipment by fire, theft or other cause, not compensated by insurance or otherwise recoverable, may be computed as a business expense and is deductible, provided evidence of such loss or damage can be produced. Such loss or damage is deductible, however, only to the extent to which it has not been made good by repair and the cost of repair claimed as a deduction.

Insurance Premiums.—Premiums paid for insurance against professional losses are deductible. This includes insurance against damages for alleged malpractice, against liability for injuries by a physician's automobile while in use for professional purposes, and against loss from theft of professional equipment and damage to or loss of professional equipment by fire or otherwise. Under professional equipment is to be included any automobile belonging to the physician and used for strictly professional purposes.

Expense in Defending Malpractice Suits.—Expense incurred in the defense of a suit for malpractice is deductible as a business expense.

Sale of Spectacles.—Oculists who furnish spectacles etc., may charge as income money received from such sales and deduct as an expense the cost of the article sold. Entries on the physician's account books should in such cases show charges for services separate and apart from charges for spectacles, etc.

NONTRADE OR NONBUSINESS EXPENSES

A new provision in the Revenue Act of 1942 permits, in the case of an individual, the deduction of all the ordinary, necessary expenses paid or incurred during the taxable year for the production or collection of income, or for the management, conservation or maintenance of property held for the production of income. While the phraseology of this provision is very broad, the Commissioner of Internal Revenue has by regulation ruled that the following expenses, among others, are not deductible under it: Commuters' expenses; expenses of taking special courses of training; expenses in seeking employment or in placing one's self in a position to begin rendering personal services for compensation; bar examination fees and other expenses incurred in securing admission to the bar, and corresponding fees and expenses incurred by physicians, dentists, accountants and other taxpayers for securing the right to practice their respective professions.

DECLARATION OF ESTIMATED TAX FOR 1944

In addition to filing the final return for 1943, individual taxpayers above the income levels described in *THE JOURNAL*, Aug. 14, 1943, must file another declara-

tion of estimated tax on or before March 15, covering the anticipated tax for the calendar year 1944. This declaration, it is assumed, will be similar in form to the declaration filed last September. Forms on which it is to be filed have not as yet been distributed. They have been withheld, no doubt, because of the pendency of tax legislation in Congress that will apply to 1944 taxes.

In completing this declaration, taxpayers will follow the same procedure utilized in completing the September declaration. They must estimate their income for the year, their exemptions and deductions, and compute the tax on the basis of such estimates. One fourth of the estimated tax must be paid when the declaration is filed, except in the case of taxpayers subject to the withholding provisions of the current tax payment act. Ample provision is made for the filing of amended declarations periodically in case the original estimates are too far out of line.

When Congressional action has been completed on the pending legislation, a statement will be prepared for publication in *THE JOURNAL* to aid physicians in complying with its requirements.

OFFICIAL NOTES

FORTIETH ANNUAL CONGRESS ON MEDICAL
EDUCATION AND LICENSURE

Program of Meetings to Be Held in Red Lacquer Room,
Palmer House, Chicago, February 14 and 15

COUNCIL ON MEDICAL EDUCATION AND
HOSPITALS, AMERICAN MEDICAL
ASSOCIATION

MONDAY MORNING—9:30

RAY LYMAN WILBUR, M.D., *Presiding*

Introduction to the Fortieth Annual Congress.

RAY LYMAN WILBUR, M.D., Stanford University, Calif., Chairman
of the Council on Medical Education and Hospitals

PROBLEMS OF POSTWAR MEDICAL EDUCATION

The Medical School Program

HAROLD S. DICHL, M.D., Minneapolis, Dean of the Medical Sciences,
University of Minnesota

Hospital Training of Medical Graduates

SAMUEL SOSKIN, M.D., Chicago, Medical Director, Dean of Post-
graduate Education, Michael Reese Hospital, Chicago

Readjustments of Returning Medical Officers

WILBURT C. DAVISON, M.D., Durham, N. C., Dean, Duke University
School of Medicine

Financing of Higher Education

FRED J. KELLY, Ph.D., Washington, D. C., Chief, Division of Higher
Education, U. S. Office of Education

Distribution of Medical Care

SAMUEL PROGER, M.D., Boston, Professor of Clinical Medicine, Tufts
College Medical School

MONDAY AFTERNOON—2:00

RAY LYMAN WILBUR, M.D., *Presiding*

WARTIME PROBLEMS IN MEDICINE AND
MEDICAL EDUCATION

The Army Medical Officer in Action

MAJOR GENERAL GEORGE F. LULL, M.D., Washington, D. C., Deputy
Surgeon General, United States Army

Medicine in the Navy

REAR ADMIRAL ROSS T. MCINTIRE, M.D., Washington, D. C.,
Surgeon General, United States Navy

The Expanding Field of Public Health

THOMAS PARRAN, M.D., Washington, D. C., Surgeon General, United
States Public Health Service

Medical Manpower for Civilians

HARVEY B. STONE, M.D., Baltimore, Vice Chairman, Directing Board,
Procurement and Assignment Service for Physicians, Dentists and
Veterinarians

Wartime Graduate Training

COMMANDER EDWARD L. BORTZ, M.D., MC-V(S), USNR, Phila-
delphia, Chairman, Wartime Graduate Medical Meetings.

THE FEDERATION OF STATE MEDICAL
BOARDS

MONDAY—6:30

FEDERATION DINNER

Licensure Trends and Medicine

ALPHONSE M. SCHWITALLA, S.J., Ph.D., St. Louis, Dean, St. Louis
University School of Medicine.

Annual Report

FRANK M. FULLER, M.D., Keokuk, Iowa, President, Federation of
State Medical Boards of the United States

Round Table Discussion—State Board Problems

ROOM SEVENTEEN

TUESDAY MORNING—9:30

ADAM P. LEIGHTON, M.D., *Presiding*

ACCELERATED MEDICAL TRAINING AND
RELATED LICENSURE IMPLICATIONS

Premedical Training

VICTOR JOHNSON, M.D., Chicago, Secretary, Council on Medical
Education and Hospitals, American Medical Association

Basic and Clinical Medical Sciences

E. M. MACLEWEN, M.D., Iowa City, President, Association of Ameri-
can Medical Colleges

Hospital Internship

JEAN A. CURRAN, M.D., Brooklyn, Chairman, Committee on Intern-
ships, Association of American Medical Colleges

Medical Licensure Aspects

J. E. MCINTYRE, M.D., Lansing, Secretary, Michigan Board of Registra-
tion in Medicine

JAMES D. OSBORN, M.D., Frederick, Secretary, Oklahoma State
Board of Medical Examiners

ROBERT R. HANNON, M.D., Albany, Secretary, New York State
Board of Medical Examiners

General discussion

TUESDAY—12:30

FEDERATION LUNCHEON
ROOM NINE

TUESDAY AFTERNOON—2:00

ADAM P. LEIGHTON, M.D., *Presiding*

The Amended Nebraska Medical Practice Act

GEORGE W. COVER, M.D., Lincoln, Secretary, Nebraska State Board
of Medical Examiners

Medical Legislation

J. W. HOLLOWAY JR., Chicago, Director, Bureau of Legal Medicine,
American Medical Association

General discussion

4:30 p. m. Executive Session

CENTRAL COUNCIL FOR NURSING EDUCATION

MONDAY—12:15

Luncheon for Lay Boards of Hospitals and Public Health Nursing
Organizations

Address

MISS LUCILE PETRY, Washington, D. C., Director, Division of Nurse
Education, United States Public Health Service.

GRAND BALLROOM

DOCTORS AT WAR

Radio broadcasts of Doctors at War by the American Medical Association in cooperation with the National Broadcasting Company and the Medical Department of the United States Army and the United States Navy are on the air each Saturday at 4:30 p. m. Eastern war time (3:30 p. m. Central war time, 2:30 p. m. Mountain war time and 1:30 p. m. Pacific war time).

The titles and guest speakers for the next four programs are as follows:

January 29.—"Dangerous Hours."

Speaker: Dr. Thomas Parran Jr., Surgeon General, United States Public Health Service.

February 5.—"White Battalions."

Speaker: Colonel Florence A. Blanchfield, Army Nurse Corps, Office of the Surgeon General, Washington, D. C.

February 12.—"Selective Placement in Industry."

Speaker: Harold A. Vonachen, medical director, Caterpillar Tractor Company, Peoria, Ill.

February 19.—"Hometown Heroes."

Speaker: James E. Paullin, M.D., President, American Medical Association.

THE CHICAGO SESSION

Applications for Space in the Scientific Exhibit

Attention is called to the fact that applications for space in the Scientific Exhibit at the Chicago session close on February 10.

Application blanks may be obtained from the section secretaries, from section representatives to the Scientific Exhibit or from the Director, Scientific Exhibit, American Medical Association, 535 North Dearborn Street, Chicago 10.

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Change in Status.—H. R. 1506 has been favorably reported by the House Committee on Military Affairs, proposing further to amend the Pay Readjustment Act of 1942. This bill, among other things, specifically provides that, in computing the pay of officers under sections 1 and 3 of the pay adjustment act, service in the Medical Reserve Corps shall be counted.

Bills Introduced.—S. 1617 proposes to enact a "Servicemen's Aid Act of 1944." It was introduced by Senator Clark of Missouri for himself and Senator George of Georgia, Senator Walsh of Massachusetts, Senator Connally of Texas, Senator Lucas of Illinois, Senator Caraway of Arkansas, Senator Vandenberg of Michigan, Senator Brewster of Maine, Senator Brooks of Illinois, Senator Wiley of Wisconsin and Senator Gurney of South Dakota. Among other things, this bill declares the Veterans' Administration to be an agency of the United States vital and essential to the successful prosecution of war, entitled to priorities second only to the War and Navy departments. The Administrator of Veterans' Affairs would be directed to expedite and complete the construction of additional hospital beds for veterans and to enter into contracts for the use of Army and Navy hospitals after the cessation of hostilities. The Administrator of Veterans' Affairs and the Secretary of War and Navy would be authorized to enter into agreements and contracts for the mutual use or exchange of use of hospital and domiciliary facilities. H. R. 3917, introduced by Representative Rankin, Mississippi, is a bill similar in objective to S. 1617. H. R. 3957, introduced by Representative Mansfield of Montana, provides for the education and training of members of the armed forces and the merchant marine after their discharge from service. H. R. 3966, introduced by Representative Brooks of Louisiana, provides that any person discharged from the active military or naval forces under a medical certificate of disability shall be classified as "IV-H" under the provisions of the Selective Service Act and shall remain in such class until eligible for reenlistment at the same rank in the branch of the military or naval forces in which he served prior to discharge. H. R. 3990, introduced by Representative Engel of Michigan, provides for vocational rehabilitation for veterans entitled to disability benefits at wartime rates. H. R. 4002, introduced by Representative Bolton of Ohio, proposes to amend the nurses' training act to provide that the head of any federal agency may request and accept transfers of student nurses transferable under the original act to a federal hospital operated by that agency in continental United States, exclusive of Alaska. H. R. 4008, introduced by Representative Fish of New York, proposes to establish at the seat of government an executive department to be known as the Department of Veterans' Security, to be administered by a Secretary of Veterans' Security appointed by the President with the advice and consent of the Senate. To this department would be transferred all functions now exercised by the Veterans' Administration.

STATE MEDICAL LEGISLATION

New York

Bill Introduced.—A. 197 proposes to provide for the establishment and administration of a system of compulsory health insurance.

Virginia

Bills Introduced.—H. 4 proposes to authorize courts to enjoin the unlawful practice of medicine, osteopathy, dentistry, chiropractic or naturopathy. No injunction may be issued with respect to a particular individual, however, until that individual has been convicted of the unlawful practice concerning which complaint is made, nor may any injunction issue until after final hearing on the merits of the case. H. 5 proposes to enact a separate naturopathic practice act and to create an independent board of naturopathic examiners to examine and license persons to practice naturopathy. "Naturopathy," according to the bill, "is defined as a system of physical culture, a drugless treatment of disease by methods supposed to stimulate or assist nature. It does not include the use of operative surgery, obstetrics, osteopathy nor the administration nor prescribing of any drug or medicine, nor the use of x-ray therapy. A certificate to practice naturopathy granted by the Board of Examiners hereinafter created will confer upon the licensee the right to practice naturopathy, to use such other sanitary and hygienic measures as are incident to this practice, and to use the title 'Doctor' or 'Dr.' in connection with his name when accompanied by the word 'naturopathy,' or to use the letters 'D.N.' in connection with his name, but the title 'Doctor' or 'Dr.' shall not be used by him alone." H. 6 proposes to authorize the creation of a so-called board of examiners in basic sciences to consist of one member of the faculty of medicine of the University of Virginia, two licensed chiropractors and one licensed naturopath. This board apparently is to examine in anatomy, histology, pathology, bacteriology, biology, diagnosis, symptomatology, sanitation and hygiene applicants for licenses to practice chiropractic or naturopathy. The bill authorizes the board to issue certificates of proficiency to those successfully passing the examinations given by it, which certificate is to authorize the holder thereof to apply to the board of chiropractic or naturopathic examiners (neither of which is now in existence) for permission to take the examination in chiropractic or naturopathy. H. 7 proposes to enact a separate chiropractic practice act and to create an independent board of chiropractic examiners. According to the bill "chiropractic is defined to be the adjustment of the twenty-four movable vertebrae of the spinal column and other articulations, and assistance of nature for the purpose of normalizing the transmission of nerve energy. It does not include the use of operative surgery, obstetrics, osteopathy, nor the administration nor prescribing of any drug or medicine. A certificate to practice chiropractic granted by the board of examiners hereinafter created will confer upon the licensee the right to practice chiropractic" and to use measures and the title Doctor of Chiropractic under stipulations similar to those appearing in H. 5 for naturopathy.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARKANSAS

District Meeting.—Dr. Gaylord F. McLeod, Magnolia, was elected president of the Fifth Councilor District of the Arkansas Medical Society at its meeting in El Dorado, January 11. Other officers include Drs. Arley D. Cathey, El Dorado, vice president and William C. Magness, Camden, Secretary. Dr. Arthur Neal Owens, New Orleans, addressed the meeting on "Some Modern Concepts of the Treatment of Burns" and Dr. Donovan C. Brown, New Orleans, "Organic Diarrhea."

CALIFORNIA

Illegal Practitioner Convicted.—Jose Manuel Gonzales Kukay, who advertised himself as "Doctor Kay" and guaranteed a thirty day cure for alcoholism by the use of capsules "and a little will power," was convicted of practicing medicine without a license, the *Hollywood Citizen-News* reported, December 29.

Personal.—Morris A. Stewart, Ph.D., Davis, associate professor of entomology at the University of California, Berkeley, has been elected president of the Pacific Coast Entomological Society. E. Gorton Linsley, Lafayette, instructor in entomology at California, has been reelected secretary.—Dr. Loren R. Chandler, San Francisco, dean of Stanford University School of Medicine, was recently honored at the dinner of the Stanford Alumni Association for his ten years on the university staff and for the work he has done on behalf of postwar medical scholarships for service men whose education was interrupted by the war.—Dr. Virginia M. Cobb, Flintridge, has resigned as medical director of the Foothill Health School for Girls, Pasadena, a position which she has held for four years.—Dr. Lillian M. Hall has recently been appointed health officer of Concord.

Lectures on Medical Jurisprudence.—On January 21 the Los Angeles County Medical Association inaugurated a series of Friday night lectures on medical jurisprudence with a talk by Dr. Frank R. Webb, Los Angeles, chief autopsy surgeon, county coroner's office, on "The Coroner's Office and the Practicing Physician." Mr. F. J. O'Ferrall, chief, division of narcotic enforcement of the state of California, gave the second lecture, January 28, on "Legal and Medicolegal Aspects of Drug Addiction." Other lecturers in the series will include:

Dr. Douglas A. Campbell, reference, state industrial accident commission, Workmen's Compensation and the Practicing Physician, February 4.

William W. Vaughn, attorney-at-law, So You're Going to Be a Witness, Doctor! February 18.

Fred N. Howser, district attorney of Los Angeles County, The District Attorney Talks to the Practicing Physician, March 3.

Hon. Samuel R. Blake, judge of superior court, Los Angeles County, The Doctor in Court, March 17.

Dr. Louis J. Regan, counsel, Los Angeles County Medical Association, Some Recent Cases—Questions and Answers, March 24.

On February 25 several of the judges of the county superior court will participate in a session entitled "Meet the Court."

COLORADO

Chamber of Commerce Opposes Wagner Bill.—The board of directors of the Denver Chamber of Commerce recently adopted resolutions opposing all the socialization features of the Wagner-Murray-Dingell bill and especially those involving the practice of medicine, according to the *Rocky Mountain Medical Journal*.

Physician Honored.—The state historical society recently awarded its first citation for distinguished historical service to the state to Dr. Margaret Long, a practicing physician of Denver since 1904 and the author of a recent book dealing with famous pioneer routes in Colorado. Dr. Long graduated at Johns Hopkins University School of Medicine, Baltimore, in 1903. According to the *Denver Post* the board of directors of the society will award these citations from time to time for outstanding historical research done in the best scholarly tradition as a means of stimulating dependable works on Colorado history.

DELAWARE

Society News.—The Delaware State Association of Clinical Laboratory Technicians was addressed on December 7 in Wilmington by J. C. Kakavas on "Penicillin—Its Production and Use." Dr. Abraham E. Rakoff, Philadelphia, addressed the November 16 meeting on "Hormone Assays and Their Diagnostic Value."

DISTRICT OF COLUMBIA

Civic Award Goes to Physician.—Dr. Charles B. Campbell, chairman of the public health committee of the Federation of Citizens Associations of the District of Columbia, has been chosen to receive the Evening Star Trophy for outstanding civic work. Dr. Campbell is a delegate to the association from the Medical Society of the District of Columbia.

The Davidson Lecture.—Dr. Walter Freeman, professor of neurology, George Washington University School of Medicine, Washington, delivered the Davidson Lecture before the Medical Society of the District of Columbia recently. His subject was "Frontiers of Multiple Sclerosis." The lecture is given on odd numbered years and commemorates the work of Dr. Edward Young Davidson. The lecturer is selected in an essay competition. This is the second time that Dr. Freeman won the honor, the first time having been in 1939, when his paper was entitled "The Surgery of Mental Disorder."

ILLINOIS

Personal.—Drs. Carl G. Johnson, Galesburg, and Andrew D. Miller, Sullivan, have recently been made members of the fifty year club of the state medical society, both having completed fifty years in the practice of medicine.

Chicago

Annual Clinical Conference.—The Chicago Medical Society will inaugurate an annual clinical conference at the Stevens Hotel, March 14-16. The program will consist of half hour periods of lectures and clinics.

University News.—Dr. Sumner L. Koch, associate professor of surgery, gave the Founders' Day Address, which opened the eighty-seventh annual session of the Northwestern University Medical School, December 29, on "The Medical Student and His Preceptors."

Dr. Warren to Give Hektoen Lecture.—Dr. Shields Warren, Boston, will deliver the twentieth Ludvig Hektoen Lecture of the Frank Billings Foundation at the Palmer House, March 24, under the auspices of the Institute of Medicine of Chicago. His subject will be "The Effects of Radiation on the Human Body."

Refresher Course in Otolaryngology.—The department of otolaryngology of the University of Illinois College of Medicine will conduct its spring refresher course, March 20-25. The course will be largely didactic, but some clinical demonstrations will be included. It is intended primarily for specialists, who, under existing conditions, are able to devote only a brief period to postgraduate review study.

Britannica Acquires Erpi Class Room Films, Inc.—Encyclopaedia Britannica, now owned by the University of Chicago, recently acquired the Erpi Class Room Films, Inc., the oldest and largest producer and distributor of motion pictures for the class room. The Citizens Board of the University of Chicago, meeting at the Chicago Club on January 24, featured one of these films on "The Digestion of Food," which clearly explains the functions and processes of the digestive system. Before the film was shown, Mr. William B. Benton, vice president of the university, gave the reasons for the acquisition of Erpi films, and Stephen M. Corey, Ph.D., executive secretary of the Britannica Educational Films Committee, explained the unusual educational advantages of moving pictures and in addition lectured on "The Digestion of Food."

MICHIGAN

Changes in Health Officers.—Dr. Georgia V. Mills, Detroit, has been appointed deputy health officer of the Saginaw City Health Unit.—Dr. James F. Wilson, Rogers City, health director of district number 4, has been appointed to a similar position with the Manistee-Benzie County health department, succeeding Dr. Lars W. Switzer, who resigned to become associated with General Motors Corporation at Bay City.

Dr. John Alexander Named Russel Lecturer.—Dr. John Alexander, professor of surgery, University of Michigan Medical School, Ann Arbor, has been selected as the Russel Lecturer at the university for the current year. The lecturer is desig-

nated each year by the executive board of the Research Club of the university, and the person chosen is one deemed to have attained the highest distinction in the field of scholarship, the honor going ordinarily to one of the senior members of the faculty. Dr. Alexander was the recipient of the Russel Award in the year 1928-1929, this award usually being given to a faculty member of the rank of instructor or assistant professor on the basis of scholarly achievement and promise for the future. Dr. Alexander is the only member of the faculty who has received both of these honors. He will deliver the Russel lecture, May 18, on "The Development of Thoracic Surgery." The winner of the Henry Russel Award will be honored at the time of the lecture.

MINNESOTA

Experiment in Rural Hospital Experience.—The School of Nursing of the University of Minnesota, Minneapolis, recently completed an experiment in rural hospital experience for senior students. The objectives of the experiment were to acquaint the students with technique and equipment and to familiarize them with some of the problems of smaller hospitals, to enable them to secure a more complete picture of patient care by seeing the background from which the patient comes and by learning of the contributions made by various groups in the community, along with their existing interrelationships, and to provide, through the students themselves, assistance to the rural hospitals in their nursing service, and to insure more adequate rural medical care by attracting more nurses to work in rural hospitals on graduation. The trial period in the experiment was divided into two terms, June 14 to July 25 and July 26 to September 5, and provided experience for four different groups of senior students. The two rural hospitals were Itasca County Hospital, Grand Rapids, and Wesley Hospital, Wadena, both having bed capacities under 50 and, in addition, 12 bassinets. In an announcement to the press, Walter C. Coffey, LL.D., acting president of the university, stated "It is expected that this successful experiment will result in its continuance at the University of Minnesota and in its widespread adoption in other parts of the nation."

MISSOURI

Fellowship in Plastic Surgery.—Dr. Earl C. Padgett, Kansas City, has made a cash donation to the Kansas University Endowment Association to be used for the establishment of a research fellowship in plastic surgery at the university's school of medicine.

NEW YORK

Dr. Godfrey Reappointed Health Officer.—Dr. Edward S. Godfrey Jr. has been reappointed as state commissioner of health by Gov. Thomas E. Dewey. *Health News* reports that the term of office is coterminous with that of governor.

Lecture on Rheumatic Fever.—Dr. John G. Fred Hiss, professor of clinical medicine, Syracuse University College of Medicine, Syracuse, gave a graduate lecture before the St. Lawrence County Medical Society, January 20, at the Potsdam Club, Potsdam, on "Rheumatic Fever—Rheumatic Heart Disease." The lecture was presented under the auspices of the state medical society and the state department of health.

New York City

New Officers of Columbia Alumni Association.—Dr. John J. H. Keating was elected president of the Alumni of the College of Physicians and Surgeons, Columbia University, at its annual dinner December 18. Other officers are Drs. Bernard S. Oppenheimer, vice president, Charles C. Lieb, secretary and James A. Corscaden, treasurer. The members of the senior class of Columbia were guests of the association at the dinner.

New Committee for Child Care.—A group of experts has been appointed by Health Commissioner Ernest L. Stebbins to work toward the raising of standards of care for children of working mothers in the four hundred day nurseries in the city. Miss Cornelia Goldsmith, B.S., on leave from Vassar College, Poughkeepsie, N. Y., where she is assistant professor of child study, is director of the study. Dr. Milton I. Levine is the pediatrician.

Fund to Study Diseases of the Mouth.—Graduates of dental colleges in the United States and abroad who have taken postgraduate work in periodontia in this country have set up a research fund to finance studies of diseases of the mouth at the College of Dentistry at New York University. Samuel

M. Robbins, D.D.S., Cleveland, is chairman of the fund committee. *Science* reports that the research will be under the direction of Samuel Charles Miller, D.D.S., New York, and will cover the efficacy of various dentifrices, causes of mouth diseases and an inquiry into the incidence of trench mouth.

Students Win Awards at Commencement.—At the eighty-fifth annual commencement at the Long Island College of Medicine, Brooklyn, December 30, the following received prizes:

Dr. Howard Otto Wunderlich, Dudley Medal, for the best clinical report of a case in the medical wards of the college hospital.

Dr. Alexander Joseph Conte, Dudley Memorial Medal, for the best clinical report of a case in the surgical wards of the college hospital.

Dr. Raymond Robert Suskind, Mitchell Prize, to the best qualified in all departments of medicine.

Dr. Millard Carnrick, Ford Prize, awarded for the best dissection.

Dr. Stephen William Giorlando, Nathan H. and Johanna Szerlip Medal, for the best thesis on pneumonia.

Dr. Clarence Denton, Phi Delta Epsilon Prize, for the highest scholastic record, also the Alumni Prize, best qualified in gynecology.

Dr. Richard Lewis Bodkin, Prize of the Class of 1898, to that member of the class whose scholastic average in the fourth year has shown the greatest improvement over that of previous years.

Dr. Alexander Garcia, Obstetric Prize, for the best thesis on a subject in obstetrics.

Dr. George Edward Murray, Jeannette Millman Memorial Award, for the best essay report on some subject in the field of oncology.

Chinese Blood Bank Moves to China.—The Chinese Blood Bank, opened at 154 Nassau Street in June 1943, has concluded its trial run in New York and will be set up on the Yunnan front at the request of Lieut. Gen. Joseph W. Stilwell and Surgeon General Loo Chih-teh. The only blood bank in China, it will serve as a model and training school for similar projects on other fronts in China. During the period of its supervision by the American Bureau for Medical Aid to China in New York 1,157 persons gave blood donations, which have been made into dried plasma and are being taken to China. Forty pounds of blood bank equipment is accompanying the staff, including the Seitz filter, which makes it possible to accept the blood of donors with a history of malaria, endemic in China. Marking its new affiliation with the Chinese army, a special ceremony was held to award commissions in the Chinese army to the eight staff members of the blood bank. Miss Adet Lin, eldest daughter of Dr. Lin Yutang and secretary of the Chinese Blood Bank, was one of five young women who received commissions as first lieutenant. A Chinese born American woman, Ruth Derr, also received this commission, as did Dr. Luetta Chen, laboratory technician, Mrs. Jean Chum Liu, head nurse and Betty Eng. Dr. Chien-lung Yi, director of the Chinese Blood Bank, and Dr. C. S. Fan, bacteriologist, received majors' commissions. Louis de Fott, in charge of blood bank machinery, was commissioned captain. The young women's uniform is similar to that of the Wacs of the American army, and the men members of the blood bank wear the regulation Chinese army uniform. The technical staff of the blood bank received two years of training in the preparation and clinical use of plasma under the supervision of Dr. John Scudder, chairman of the blood bank at Presbyterian Hospital and Sloane Hospital for Women, New York, and chairman of the blood bank committee of the American Bureau for Medical Aid to China.

NORTH CAROLINA

Dr. Stevick Named Acting Director of Epidemiology.

—Dr. Charles P. Stevick, Beaufort, health officer of Carteret County, has been appointed acting director of the division of epidemiology of the state board of health with headquarters at Raleigh. Newspapers report that Dr. Stevick will continue in this position for the duration.

Physician Honored.—At a meeting of the Rotary Club, December 21, Dr. Stephen A. D. Malloy was presented in absentia with a trophy naming him as "the outstanding citizen of Yanceyville" and "the first citizen of Caswell County." He was also presented with a platter on which will be inscribed "Caswell's First Citizen." In making the presentation, the Rev. Roy F. Whitley said:

For forty five years this citizen has been a leader in the social and civic and religious life of Caswell. He served for many years on the district school committee and still is the champion of good schools. He served his county as medical examiner on the draft board during the first world war and is still rendering conspicuous service in this one. He was chairman of the Democratic executive committee for over twenty years and has been signally honored by it several times. He has been a leader in Masonry for over forty years. He is now both coroner and county physician. He has been cited by the medical fraternity for conspicuous service and honored many times. So great and successful were his untiring efforts in securing our present water system that this club called him up and presented him with a miniature spigot, which now adorns his watch chain. He has backed every forward movement in the county for the public good.

The award was presented to Dr. Malloy in absentia because he was in the hospital on account of illness.

OHIO

Dr. Bruner Completes Fifty Years in the Practice of Medicine.—Dr. William E. Bruner, professor emeritus of ophthalmology, Western Reserve University School of Medicine, Cleveland, observed his fiftieth year in the practice of medicine in Cleveland at a dinner January 4. Dr. Bruner was host at the dinner. His guests, who were his associates at the eye clinic of the old Lakeside Hospital, gave him a silver tray with their names engraved on it. Dr. Paul G. Moore, now the oldest in point of service at the eye clinics at City and University hospitals, made the presentation speech. Others present were Drs. Harley H. Brelsford, Abram B. Bruner, Webb P. Chamberlain, Homer J. Hartzell, Mark W. Jacoby, Shandor H. Monson, Michael Paul Motto, Charles F. Nelson and Harold V. Phelan. Dr. Bruner is 78 years old. He was on the staff of St. Vincent Charity Hospital until 1916, when he went to Lakeside Hospital, remaining there until after its removal to its present location on the university campus. Dr. Bruner became professor emeritus at Western Reserve in 1936.

Medicine to Benefit in Large Bequest.—Funds estimated at more than eight million dollars have been left in trust by the late Mrs. Elizabeth Severance Prentiss for the advancement of medicine, health, art, music, education and religion through institutions in which she was interested for many years before her death, January 4. Thirty-seven per cent of the assets are to support the Elizabeth Severance Prentiss Foundation, which Mrs. Prentiss established on Jan. 17, 1939 with the provision that its existence remain undisclosed until after her death. The general objectives of the foundation, for which the National City Bank of Cleveland is trustee, are to promote medical and surgical research, to initiate and further activities in the field of public health, to aid hospitals and health institutions in Cuyahoga County, to improve methods of hospital administration and to aid in support of plans to make hospitalization and medical care available to all people, especially those of low income. The remainder of the income from trust assets reserved

the public welfare is to be divided as follows: The Cleveland Museum of Art will receive 25 per cent, the Musical Arts Association 10 per cent, Western Reserve University 7 per cent, Cleveland Museum of Health and Hygiene and Oberlin College each 5 per cent, the Cleveland School of Art and the Allen Memorial Medical Library each 3 per cent, the Church of the Covenant and the Board of Foreign Missions of the Presbyterian Church each 2 per cent and Berea College, Berea, Ky., 1 per cent. In accordance with Mrs. Prentiss's wishes, a separate fund will be in trust for each of these institutions, which will receive the income from the securities in such funds. Management of the Elizabeth Severance Prentiss Foundation will be entrusted to a board of managers named by Mrs. Prentiss when she created the foundation: John P. McWilliams, Cleveland, John A. Hadden, Cleveland Heights, Lewis B. Williams, Cleveland Heights, Robert F. Bingham, Shaker Heights, and Ralph S. Schmitt, Shaker Heights. While the foundation was set up by Mrs. Prentiss as a means of devoting a part of her fortune to the interest of health and the advancement of medical science, it provides an opportunity for any one who shares her interest in those objectives to leave money for those specific purposes. In establishing the foundation she expressed the request that at least 50 per cent of the income derived from her foundation gifts be paid to St. Luke's Hospital Association as long as its standards of service and administration are on a level prevailing in a first class hospital. She also directed that most of the foundation activities be carried on in Ohio and that at least 60 per cent of all disbursement be made within the state.

OREGON

Gifts to Medical Museum.—A collection including books, pictures, diplomas and microscopes belonging to the late Dr. Andrew C. Smith has been given to the museum now being developed at the University of Oregon Medical School, Portland. Dr. Esther C. Pohl Lovejoy, New York, one of the first women graduates of the medical school and donor of the Pohl Memorial Scholarship, has given the medals and certificates of honor given her by near east countries for services during the first world war in connection with her work as director of the American Women's Hospitals, with the idea of forming a nucleus of a collection of medals and honors conferred on Oregon physicians who have been active in the present war. Dr. Albert E. Mackay, Portland, is preparing a gift of urologic instruments dating from 1887 to the present. He has also given nearly all his medical books, including a Vesalius, printed on parchment in the 16th century. Mrs. Francis Page Adams has donated a set of surgical instruments in memory of her husband, who died in 1942. The

instruments were carried all through the Civil War. Other gifts include a set of instruments presented by the late Dr. Alfred Coleman Kinney, first and fiftieth president of the Oregon State Medical Society. Dr. Kinney, who died in July 1942 at the age of 93, had been named president-elect for 1930, when the society would have been 75 and he 100 years old. Dr. Kinney's son, Dr. A. W. Kinney, Ilwaco, Wash., gave a copy of Gray's Anatomy (second American edition, 1862) which had been used by his father and uncle in the dissecting room in Bellevue Hospital while they were students there, 1867-1870.

TENNESSEE

State Group Plans 1944 Meeting.—The trustees of the Tennessee State Medical Association have decided to hold their annual meeting in Nashville, April 11-13, at the Noel Hotel. The 1943 meeting was canceled because of the war, but the trustees feel sure that the meeting next year will be more than justifiable.

Postgraduate Instruction in Surgical Diagnosis.—Dr. Joseph R. Bromwell Branch, Macon, Ga., formerly professor of surgery at the National College of Medicine of Shanghai, China, has been conducting a program of postgraduate instruction in surgical diagnosis throughout the state under the auspices of the Tennessee State Medical Association. The Commonwealth Fund and other agencies are also cooperating. Subjects covered by Dr. Branch included the principles of wound healing, the management of wounds—with special reference to war wounds, the diagnosis and management of fractures including head injuries, infections of the hand illustrated with moving pictures, the treatment of burns, the management of shock, preoperative and postoperative care of patients, surgical diseases of the abdomen, acute abdominal emergencies, diseases of the breast, and nontuberculous diseases of the chest and cancer with particular reference to its prevention and early recognition.

Society News.—The Chattanooga and Hamilton County Medical Society opened its 1944 session January 6 with a banquet. The society was addressed by Dr. William D. Anderson, January 13, on "Anemias in Infancy." Dr. Cecil E. Newell, January 20, "The Treatment of Undescended Testicle." Dr. Charles R. Thomas, January 27, "Discussion of Complications of Anti-Rabies Treatment with Presentation of Case." Future meetings of the society will be addressed by the following:

- Dr. D. Isbell, February 3 (subject not announced).
- Dr. Chester L. Lassiter, February 10, Hemorrhage of Nose and Throat.
- Dr. Gene H. Kistler, February 17, Carcinoma of the Cecum.
- Dr. Oscar Merton Derryberry, February 24, Malaria Control in the Tennessee Valley.
- Dr. James Lewis L. Bibb, March 2, Some New Methods in Handling the Tuberculosis Problem.
- Dr. Frederick E. Marsh, March 9 (subject not announced).
- Dr. A. Ellis Goodloe, March 16, Unforgettable Experiences in a Series of 529 Consecutive Bronchi and Esophageal Cases.
- Drs. Samuel H. Long and William E. Van Order, March 23, Chemotherapy in Ear, Eye, Nose and Throat Disease and History and Origin of Some of the Common Drugs, respectively.
- Dr. Earl R. Campbell, March 30 (subject not announced).

All physicians are of Chattanooga.

TEXAS

Meeting of Medical Examining Board.—The Texas State Board of Medical Examiners will hold its executive session and examination in Houston, March 22-24. Additional information may be obtained from Dr. Thomas J. Crowe, secretary of the board, 810 Main Street, Dallas 2.

Appointment in Bacteriology at Baylor.—Kenneth L. Burdon, Ph.D., formerly assistant professor of immunology and bacteriology at Louisiana State University School of Medicine, New Orleans, was appointed professor of bacteriology at the University of Baylor School of Medicine, Houston, recently.

WEST VIRGINIA

Refuse Osteopath's Petition for Appointment as Health Officer.—On January 7 the Supreme Court of Appeals of West Virginia refused for the second time the petition of Earl C. Hahn, D.O., St. Marys, for a writ of mandamus compelling the public health council to approve the recommendation of the Pleasants County court and appoint him health officer for the county. In the original petition filed on Nov. 30, 1943, also refused by the court, Dr. Hahn set up the fact that he is engaged in the practice of his profession at St. Marys and that he was recommended by the court of Pleasants County for appointment as county health officer for the unexpired term ending Dec. 31, 1944 and that subsequently the public health council unanimously refused to make the appointment. He charged that the sole reason the appoint-

ment was not made was that he is a doctor of osteopathy and not a doctor of medicine. Dr. Hahn claimed that, as a duly licensed osteopathic physician and surgeon, he is a "legally qualified physician" within the purview of chapter 16, article 1, section 1 of the code and as such, entitled to appointment as county health officer, and that the action of the public health council in refusing to make the appointment was "arbitrary, capricious, discriminatory, prejudicial and contrary to the statutes of the state." In a supplemental petition, filed December 7, Dr. Hahn incorporates a letter from Dr. John E. Offner, state health commissioner, in which the latter is reported to have said that, under the policies of the public health council, health officers must have the same qualifications as graduates of class A medical schools and must be otherwise qualified to be licensed to practice medicine in West Virginia. Dr. Hahn claimed that, notwithstanding the fact that one of the duties of the public health council is to "define the qualifications of local health authorities and directors of divisions, and discharge other like duties," it cannot promulgate rules and regulations or make definitions which are contrary to law. He further charged that it is provided in chapter 30, article 4, section 10 of the code that osteopathic physicians and surgeons licensed in this state shall have the same rights as physicians and surgeons of other schools of medicine and that any rule or regulation or definition which deprives him of rights granted to physicians and surgeons of other schools of medicine is void and contrary to law.

GENERAL

Urology Award.—The American Urological Association announces its annual award "not to exceed \$500" for an essay on the result of some specific clinical or laboratory research in urology. The amount of the prize is based on the merits of the work presented, and if the committee on scientific research deems none of the offerings worthy, no award will be made. Competitors shall be limited to residents in urology in recognized hospitals and to urologists who have been in such specific practice for not more than five years. The selected essay (or essays) will appear on the program of the forthcoming meeting of the American Urological Association, June 19-22, Hotel Jefferson, St. Louis. Essays must be in the hands of the secretary, Dr. Thomas D. Moore, 899 Madison Avenue, Memphis 3, Tenn., on or before March 15.

Ella Sachs Plotz Foundation.—Eighteen applications for grants were received during 1943 by the trustees of the Ella Sachs Plotz Foundation for the Advancement of Scientific Investigation, thirteen of which came from the United States, the others coming from five different countries in Europe, Asia and North and South America. In the twenty years of its existence the foundation has made 481 grants, which have been distributed to scientists throughout the world. According to the annual report the list of investigators, with the purpose of the research aided during the year, is as follows:

Dr. George Barkan, Boston University School of Medicine, continuation of investigations in the field of sulfonamide derivatives and related compounds.

George A. Emerson, Ph.D., West Virginia University School of Medicine, Morgantown, study of nutritional factors in susceptibility to lethal effects of anoxia.

Anna Goldfeder, New York University College of Medicine, continuation of studies on the relation between radiation effects and cell viability as indicated by induced resistance to transplanted tumors.

M. E. Hunter, Royal Victoria Hospital, Montreal, Quebec, investigation of mild nutritional deficiencies in rheumatic fever.

Hermann Lehmann, Runwell Hospital, Essex, England, continuation of research on carbohydrate metabolism of isolated tissue.

Alexander Lipschutz, Santiago, Chile, South America, work on (1) the chemical structure of the steroids as related to antifibromatogenic activity, (2) the metabolic fate of fibromatogenic and antifibromatogenic steroids, (3) the fibromyoma of the prostatic region induced by estrogens in the guinea pig.

Edward P. Mumford, M.Sc., Stanford University, Calif., continuation of basic scientific research bearing on public health and the present emergency in the Pacific.

Hazel E. Munsell, Ph.D., School of Tropical Medicine, San Juan, P. R., study of the nutritional status, as regards vitamins, of sample populations of Puerto Rico.

Carl Neuberg, Ph.D., New York University, continuation of work on carbohydrate metabolism of micro-organisms and animal cells.

Herbert Silvette, Ph.D., University of Virginia, Charlottesville, investigations of the effect of low barometric pressure on renal function and on the action of drugs on the kidneys.

Thorndike Memorial Laboratory, Boston City Hospital (Dr. George R. Minot, director), in recognition of the late Dr. Francis W. Peabody's services to the foundation.

Dr. Bernhard Zondek, Rothschild Hadassah Hospital, Jerusalem, Palestine, continuation of investigations dealing with impairment and stimulation of the functions of the pituitary gland and especially of the gonadotropic hormone of the anterior pituitary lobe.

United States and American Republics Exchange Medical Knowledge.—Dr. Eugene P. Campbell, field director, division of health and sanitation, Institute of Inter-American Affairs, wrote from La Paz, Bolivia, December 22, that he wished to place correctly the credit for the great amount of

work carried out in the extensive cooperative program between the United States and the American republics. *THE JOURNAL*, Oct. 23, 1943, page 498, carried a news item outlining the program, which, according to Dr. Campbell, was directed by Dr. Henry E. Meleney, Herman M. Biggs professor of preventive medicine, New York University College of Medicine. The time spent with the health and sanitation field party in Guatemala was under the direction of Major Robert L. Vought and in Honduras of Major Isaac Frank Tullis Jr., M. C., A. U. S., both of whom devoted much time and effort to the success of the plan. Credit is given also to the cooperation from the many physicians in the various United Fruit Company hospitals. In addition to the names published in the news item, the following are also added to the list of United States physicians who have finished or are receiving training:

James Fred Denton, Ph.D., assistant professor of bacteriology and public health, University of Georgia School of Medicine, Augusta, to Tela, Honduras.

Dr. Francis B. Johnson, professor of clinical pathology, Medical College of the State of South Carolina, Charleston, to Tela.

Dr. William C. Black, professor of pathology, University of Colorado School of Medicine, Denver, to Quirigua, Guatemala.

Robert B. Dienst, Ph.D., associate professor of bacteriology and public health, University of Georgia School of Medicine, to Tiquisate, Guatemala.

Dr. Orlyn B. Pratt, associate professor of pathology, College of Medical Evangelists, Los Angeles, to Tiquisate.

Dr. Raymond M. Hill, instructor in medicine, College of Medical Evangelists, to Limón, Costa Rica.

Dr. Thomas H. Hunter, assistant in medicine, Columbia University College of Physicians and Surgeons, New York, to Golfito, Costa Rica.

Dr. John H. Scherer, assistant professor of medicine, Medical College of Virginia, Richmond, to Almirante, Panama.

Dr. William J. Pyles, instructor in pathology, Columbia University College of Physicians and Surgeons, to Tiquisate.

Dr. Donald S. Martin, associate professor of bacteriology, Duke University School of Medicine, Durham, N. C., to Tiquisate.

Dr. John Wylie, professor of public health and preventive medicine, Queen's University Faculty of Medicine, Kingston, Ont., to Quirigua.

Dr. William M. Hammon, assistant professor of epidemiology, University of California Medical School, San Francisco, to Almirante.

Dr. Roger D. Baker, associate professor of pathology, Duke University School of Medicine, Buffalo, to Limón.

Dr. Henry Packer, associate professor of preventive medicine, University of Tennessee College of Medicine, Memphis, to Puerto Armuelles, Panama.

Dr. William R. Platt, assistant in pathology, Emory University School of Medicine, Atlanta, Ga., to Golfito.

Dr. Stockton Kimball, associate in medicine, University of Buffalo School of Medicine, Buffalo.

Dr. Grant O. Favorite, professor of bacteriology, Hahnemann Medical College and Hospital of Philadelphia, to Quepos, Costa Rica.

Dr. Robert F. Korn, New York State Department of Health, Amsterdam, N. Y., to Tela.

Dr. Hunter S. Cook, associate professor of pathology, Hahnemann Medical College, to Tela.

LATIN AMERICA

Professional Practice May Be Limited to Mexican Citizens.—A legislative measure, which has already passed the Mexican chamber of deputies, will, if passed by the senate, virtually deprive American professional men and women of the right to earn a living in Mexico. According to an announcement the initiative, intended to end "charlatanism" south of the border, would alter the Mexican constitution so as to deny the privilege of professional practice to all but Mexican citizens. While it would apply exclusively to the Federal District, equivalent to the United States District of Columbia and federal territories, it is viewed locally as the entering wedge for the spread of similar legislation throughout the country. Since the majority of American professional people are believed concentrated in Mexico City, which is located within the Federal District, they would be among the first to feel the weight of such restrictions. Professional classes which would be affected by the amendment include physicians and surgeons, nurses, social workers, midwives, biologists, bacteriologists, radiologists, pharmacists, pharmaceutical chemists, chemical engineers, engineering specialists, metallurgical assayers, dentists, veterinarians, agriculturists, architects, actuaries, public accountants, notary publics, lawyers, economists, primary-school teachers, professors of higher education, civilian airplane pilots and seamen.

CORRECTIONS

Medicine and the War.—In the item "Army General Praises Navy Doctor" in *THE JOURNAL*, January 1, page 44, the first name of Lieut. Comdr. Strongin should have been given as Herman instead of Henry.

Sublingual Administration of Drugs.—In *THE JOURNAL*, January 15, page 138, paragraph 2, one of the statements should read "without exception all the drugs I have studied are more readily absorbed from the sublingual area of the dog than from the same area in man." The comma between "fistula" and "tone changes" in the preceding sentence should be omitted.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Dec. 18, 1943.

A New Center for Plastic Surgery: Munificent Gift by the Nuffield Trust

The gifts to medicine of Lord Nuffield, the automobile magnate, have been reported from time to time in previous letters. The latest manifestation is the offer of the Nuffield Provincial Hospitals Trust of \$40,000 a year for ten years toward the cost of establishing and maintaining a plastic surgery unit by the University of Oxford. The university has accepted the offer and has appointed Mr. T. F. Kilner as the first director of the plastic surgery unit, with the title of Nuffield Professor of Plastic Surgery. The Radcliffe Infirmary will provide hospital facilities for the unit, and these will be supplemented by the Ministry of Pensions.

The total of Lord Nuffield's gifts to the University of Oxford for the development of the medical school amounts to \$14,000,000. They began with the purchase of the observatory buildings and grounds adjoining the Radcliffe Infirmary, which he gave to the university to be used for the purpose of medical teaching and research. A second gift of \$10,000,000 for the development of the Medical School followed. The new unit will be a center for the training of plastic surgeons and will work in close collaboration with the university laboratories, in which parallel investigations of the biochemical and other problems connected with the growth and repair of tissue, fundamental to plastic surgery, will be carried on. The need for such a center is felt.

The war has greatly increased the demand for the services of plastic surgeons, and Lord Nuffield's proposal emanated from the desire to provide the best possible treatment for casualties, especially the disfigurements of burns. Although the demand may be less after the war, plastic surgery will play a great part in the services envisaged by the government for the rehabilitation of the injured.

Postwar Food Planning

Plans to take the British people off their prewar diet of "tea and margarine" and onto a diet of butter, milk and meat are being worked out for the government by dietitians. This will involve the creation of a permanent food commission with wide powers to plan the production and distribution of health supporting foods for both rich and poor. Its work will include (1) reorganization of British agriculture to increase the production of milk, eggs, fruit, vegetables and meat, (2) distribution of these foods to secure a diet adequate for health within the reach of every family, however poor, and (3) organization of food either by home production or import, if necessary, to make certain that at no time will there be a shortage of any essential food.

Food experts who have advised the government during the war are now planning for the postwar era. They hold that such a commission will revolutionize agriculture and lay the foundation of prosperity in other basic industries. White bread, margarine, jam and tea, regarded by large masses of people as a staple diet, will be discouraged. Instead, the people will be given an opportunity to increase their consumption of milk, eggs, fruit, vegetables and meat. World food policy, with which Great Britain will be closely linked, will be directed to the same end. The intention is now to extend the policy of "enough to eat" to "enough of the right kind of food." Perhaps the most valuable dietetic reform to come from wartime food control was the abolition of white bread. The deficiency of vitamins and minerals produced in "the staff of life" was one of the greatest evils of our civilization.

Control of the Use of Radon

The incautious use of x-rays for minor skin disorders by physicians without special knowledge and skill frequently resulted in burns and other injuries when radiotherapy was first introduced. Litigations followed, and the services of the Medical Defense Union were often required. In its annual report the Union now reaffirms its view that radiotherapy requires a high degree of skill if damage to normal tissues is to be avoided. The same danger exists in the use of the more recently introduced radon. The National Radium Commission and the Medical Research Council have determined the conditions under which radon, prepared from centers under their control, shall be supplied. These have also been accepted by the London Hospital Radon Service and the Manchester Radium Institute. The radon centers will supply radon only to hospitals which have been approved by the Radium Commission and not direct to individual clinicians. Only those hospitals which have a properly equipped radiotherapeutic department, with a radiotherapist and physicist as part of the staff, and which have a properly organized follow-up of patients, will be approved. Such hospitals must see that the radon is properly used, with adequate precautions against wrong dosage.

Compulsory Notification of Infective Jaundice

Because of the increasing prevalence of infective types of jaundice, which has caused the minister of health some concern, investigations have been undertaken by an expert team working at Cambridge in collaboration with the Medical Research Council. An intensive study is being made of the epidemiology of this disease, of which little is known at present, in order to bring it under control and establish methods of treatment. In order that the fullest possible information may be obtained about the incidence of jaundice, the minister of health has ordered the compulsory notification to local health officers in the eastern part of England (since the center of research is there) of the following forms of jaundice: catarrhal jaundice, acute inflammation of the liver, acute necrosis of the liver, acute yellow atrophy of the liver, toxic jaundice and infective jaundice. If the evidence received suggests an outbreak of some dimensions, the research team may have recourse to field work, which should be of assistance to health officers and practicing physicians in the diagnosis and treatment of these diseases; but it is not expected that the team will undertake field work on individual cases.

On receipt of a certificate under these new regulations or on becoming aware of a case or suspected case of one of the diseases specified, the local health officer or an officer acting under his instructions shall make inquiries and take such steps as are necessary for investigating the source of infection and preventing spread of the disease.

Marriages

HENRY O. HARDESTY, Jennings, Kan., to Mrs. Tressie B. Davidson of Sheridan, Mo., in Oberlin, Kan., December 6.

ALBERT CLIFTON SMITH JR., Glenn Springs, S. C., to Miss Rachel Ingram Monger of Lynchburg, Va., November 6.

CHARLES HERMAN ANDREWS JR., Sumter, S. C., to Miss Leila Virginia Riley of Ridgeville, November 22.

WALTER JOSEPH ALEXANDER, Binghamton, N. Y., to Miss Edith Merle Filsinger of Buffalo, October 16.

HARTFORD ERNEST GRUGAN, Lock Haven, Pa., to Miss Mary Lou Welty of Baltimore, December 25.

HENRY LEE HOWARD, Savannah, Ga., to Miss Julia T. Booker of Chapel Hill, N. C., December 16.

VINICIO G. LIVA, Lyndhurst, N. J., to Miss Helen Wagner of New York, November 23.

RICHARD B. DAVIS to Miss Nettie Schoolfield, both of Greensboro, N. C., November 27.

Deaths

John Ralph Ballinger, Chicago; Rush Medical College, Chicago, 1900; member of the Illinois State Medical Society and for many years chairman of the medicolegal committee; member of the House of Delegates of the American Medical Association in 1918; past president of the Northwest branch of the Chicago Medical Society; formerly assistant professor of neurology at the University of Illinois College of Medicine; member of the examining board during World War I; served on the attending staffs of the Lutheran Deaconess and Norwegian American hospitals; author of "Medico-legal Law Brief in Relation to Mal-practice Suits, with Citations"; died in Atchison, Kan., December 29, aged 68, of chronic cardiovascular renal disease, hypertension and myocarditis.

Jacob Daniel Keiper, Johnstown, Pa.; Eclectic Medical Institute, Cincinnati, 1906; member of the Medical Society of the State of Pennsylvania; past president of the Cambria County Medical Society; for many years president of the Dale National Bank; president of the Dale borough school board; served as a first lieutenant in the medical corps of the U. S. Army and as chairman of the county Selective Service Board during World War I; recently examiner for County Selective Service Board number 4; chief of the gynecology section of Memorial Hospital; died December 17, aged 60, of coronary thrombosis.

Perry Chapman Bentle Ⓢ Greensburg, Ind.; Medical College of Indiana, Indianapolis, 1904; past president of the Decatur County Medical Society; served as president of the Fourth District Medical Society; school physician; on the staffs of the Decatur County Memorial Hospital and the Odd Fellows Home Hospital; member of the board of directors of the Decatur County National Bank and vice president of the board of directors of the Y. M. C. A.; examining physician for the Selective Service; member of the Rotary Club; died December 19, aged 65, of heart disease.

James Boyd Mason Ⓢ London, Ky.; University of Louisville Medical Department, 1894; member of the Radiological Society of North American, Inc.; past vice president of the Kentucky State Medical Association; served as a major in the medical corps of the U. S. Army during World War I; major, medical corps, Kentucky National Guard; state surgeon for Kentucky; member of the local board of examining surgeons for pensions; examining physician for the local draft board; president of the National Bank of London; died December 2, aged 69, of chronic myocarditis.

Ursa S. Abbott Ⓢ Richmond, Calif.; College of Physicians and Surgeons of San Francisco, 1902; served in the medical corps of the U. S. Army during World War I; at one time local surgeon for the Atchison, Topeka and Santa Fe Railway, the Pullman Company and the Atlas Powder Company; on the staff of the Richmond Hospital; died November 23, aged 70, of chronic myocardial degeneration.

Thomas Littleton Bauguss, Memphis, Tenn.; Memphis Hospital Medical College, 1886; died in St. Joseph's Hospital January 1, aged 92, of pneumonia, following injuries received in a fall.

Felix S. J. Bessette, Chicago; Rush Medical College, Chicago, 1889; member of the Illinois State Medical Society; died in the Mercy Hospital, December 22, aged 78, of cerebral hemorrhage.

Albert Fitzhugh Beverly, Austin, Texas; Medical Department of Tulane University of Louisiana, New Orleans, 1908; member of the State Medical Association of Texas; fellow of the American College of Surgeons; served in France and England as a major in the medical corps of the U. S. Army during World War I; died in the Seton Hospital December 9, aged 58, of general arteriosclerosis and myocarditis.

Harold Elmer Bogart, Mount Vernon, N. Y.; Cornell University Medical College, New York, 1921; assistant medical director of the New York Life Insurance Company, New York; served during World War I; died December 18, aged 47, of coronary thrombosis.

McKinley Jephth Bohannon, Terre Haute, Ind.; Indiana University School of Medicine, Indianapolis, 1934; member of the Indiana State Medical Association; on the staff of Union Hospital, where he died December 13, aged 47, of coronary disease.

Lawrence Breitbart Ⓢ Flushing, N. Y.; George Washington University School of Medicine, Washington, D. C., 1927; fellow of the American College of Surgeons; chief examining physician for local draft board number 272; asso-

ciate surgeon, Flushing Hospital and Dispensary; associate visiting surgeon, Queens General Hospital, Jamaica; died December 21, aged 40, of coronary occlusion.

Horatio Alford Brown Ⓢ Jackson, Mich.; Rush Medical College, Chicago, 1909; past president of the Jackson County Medical Society; fellow of the American College of Surgeons; chief medical examiner for county draft board; member of the board of managers and chief of staff, W. A. Foote Memorial Hospital; chief of staff, Mercy Hospital; died in the Good Samaritan Hospital, Lexington, Ky., December 19, aged 62, of aplastic anemia.

Ira Christopher Brown, Seattle; University of Buffalo School of Medicine, 1888; member of the Washington State Medical Association; veteran of the Spanish-American War and World War I; for many years medical director for the city public schools; died in the Veterans Administration Facility, American Lake, December 8, aged 82, of cardiac asthma.

John L. Brubaker, Altoona, Pa.; Washington University School of Medicine, Baltimore, 1874; member of the Medical Society of the State of Pennsylvania; veteran of the Spanish-American War; for many years a surgeon for the Pennsylvania Railroad; died December 13, aged 89, of pneumonia.

George Van Buskirk Buehler Ⓢ Bedford, Mass.; University of Pennsylvania Department of Medicine, Philadelphia, 1895; died November 19, aged 67, of heart disease.

Leo Aloysius Bussman, Buffalo; University of Buffalo School of Medicine, 1913; died December 9, aged 58, of heart disease.

Emory Ward Carr Ⓢ Lyons, N. Y.; Baltimore Medical College, 1902; formerly mayor; served as president of the school board; died in the Buffalo General Hospital, Buffalo, December 17, aged 70, of cerebral thrombosis.

Paul Bernard Cassidy Ⓢ Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1899; for many years secretary-treasurer of the American Association of Medical Milk Commissions; served as medical director of St. Vincent's Hospital for Women and Children; on the staff of the Misericordia Hospital, where he died December 12, aged 68, of pneumonia.

Henry William Champlin, Towanda, Pa.; University of Michigan Homeopathic Medical School, Ann Arbor, 1881; died December 8, aged 86, of Parkinson's syndrome and uremia.

Benjamin Franklin Devitt, Philadelphia; Medico-Chirurgical College of Philadelphia, 1904; died in the National Stomach Hospital December 4, aged 73, of acute cardiac dilatation due to senile pneumonia.

Townsend H. Dickinson Ⓢ Dayton, Ohio; Miami Medical College, Cincinnati, 1906; member of the American Academy of Pediatrics; past president of the Montgomery County Medical Society; school physician; served on the staffs of the Good Samaritan Hospital, St. Elizabeth's Hospital and the Miami Valley Hospital, where he died December 3, aged 60, of acute hemorrhagic nephritis.

William Lloyd Digges, New Madrid, Mo.; Washington University School of Medicine, St. Louis, 1897; died in St. Francis Hospital, Cape Girardeau, November 27, aged 69, of cerebral hemorrhage.

Edwin Lyon Draper Ⓢ Champaign, Ill.; Harvard Medical School, Boston, 1907; Champaign County deputy coroner; served in England and France during World War I; on the staffs of the McKinley and Mercy hospitals, Urbana, and the Burnham City Hospital; member of the athletic council of the University of Illinois; died in Urbana November 29, aged 61, of cerebral hemorrhage.

Moury Irvin Ellis, East Orange, N. J.; Vanderbilt University School of Medicine, Nashville, Tenn., 1917; member of the Medical Society of New Jersey; served as a lieutenant commander at the Great Lakes Naval Training Station during World War I; on the surgical staff of the East Orange General Hospital; died December 7, aged 48, of bronchopneumonia and streptococcal throat.

John Silveira Enos, Newark, N. J.; Harvard Medical School, Boston, 1911; died November 24, aged 60, of coronary occlusion and arteriosclerosis.

Robert O. Friedrich, Milwaukee; Milwaukee Medical College, 1906; member of the State Medical Society of Wisconsin; died November 26, aged 73, of cyanide poisoning, self administered.

Maurice Jacob Greenstein, Bridgeport, Conn.; University of the South Medical Department, Sewanee, Tenn., 1905; served on the staffs of St. Vincent's and Bridgeport hospitals; died November 27, aged 61, of coronary occlusion.

Clara O. Griffin, Eden, N. Y.; University of Buffalo School of Medicine, 1906; died November 18, aged 72, of angina pectoris.

Alonzo Potter Burgess Holly, Miami, Fla.; New York Homeopathic Medical College and Hospital, New York, 1888; at one time consul for Haiti to the Bahama Islands; died November 28, aged 78, of carcinoma of the prostate.

Ernest Arthur Kaeslau Ⓢ Buffalo; University of Buffalo School of Medicine, 1924; member of the board, Millard Fillmore and Lafayette General hospitals; died November 27, aged 44, of coronary thrombosis following an appendectomy and umbilical hernia.

John Barney LaHiff, Clarksville, Tenn.; University of Nashville Medical Department, 1894; Vanderbilt University School of Medicine, Nashville, 1894; member of the Tennessee State Medical Association; died November 30, aged 72, of pleurisy.

Romulus Zachariah Linney Ⓢ Madison, Tenn.; University of Pennsylvania School of Medicine, Philadelphia, 1928; examining physician for Selective Service Board number 10 of Davidson County; member of the staff of the Protestant Hospital, Nashville; on the visiting staffs of St. Thomas Hospital, Nashville, and the Madison Rural Sanitarium and Hospital, Madison College; died in Vanderbilt Hospital, Nashville, December 19, aged 42, of carcinoma of the trachea.

Athens Vallette Lodge, Brewster, Mass.; University Medical College of Kansas City, Mo., 1900; member of the Massachusetts Medical Society; on the staff of the Cape Cod Hospital, Hyannis; died November 18, aged 71, of coronary occlusion.

Jesse S. Maloy Ⓢ Shinnston, W. Va.; Medical College of Virginia, Richmond, 1898; died November 21, aged 70, of carcinoma.

Wallace Jefferson Masters, Wichita Falls, Texas; University of Texas School of Medicine, Galveston, 1911; member of the State Medical Association of Texas; president of the Wichita County Medical Society in 1940; on the staffs of the Wichita General and Bethania hospitals; for many years a member of the Rotary Club; died November 26, aged 58, of coronary occlusion.

Charles Alexander McBeth, Utopia, Texas; Atlanta Medical College, 1895; served as a member of the school board of Utopia; died in the Nix Hospital, San Antonio, November 5, aged 70, of coronary thrombosis.

Charles Franklin Montgomery, Mount Pleasant, Utah; St. Louis University School of Medicine, 1906; served during World War I; died in Kansas City, Kan., November 19, aged 60, of coronary occlusion.

Paul O'Brien Ⓢ Rutherford, N. J.; Cornell University Medical College, New York, 1908; served in the medical corps of the U. S. Army during World War I; died in the Doctors Hospital, New York, October 19, aged 62, of carcinoma of the finger with metastases to arm, axilla and spine and terminal bronchopneumonia.

Ole Olson, Lincoln, Neb.; Nebraska College of Medicine, Lincoln, 1909; served overseas during World War I with the rank of captain in the medical corps of the U. S. Army; elected commissioner of Lancaster County in 1934; died November 8, aged 66.

William A. Paxton, Boley, Okla.; University of West Tennessee College of Medicine and Surgery, Memphis, 1907; served as mayor of Boley, assistant county health officer and chairman of the local Red Cross; died in the Park Sanitarium, Guthrie, October 15, aged about 68, of mitral regurgitation.

Wood K. Porter, Turney, Mo.; Washington University School of Medicine, St. Louis, 1894; died in St. Luke's Hospital, Kansas City, November 4, aged 73, of heart disease.

Clarence Day Powell, Valier, Mont.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1905; member of the Medical Association of Montana; served as mayor for three terms; died in Vancouver, Wash., November 25, aged 63, of cirrhosis of the liver.

Sergius S. Rakitin, San Francisco; Military Medical Academy, Leningrad, R. S. F. S. R., 1909; member of the California Medical Association; died in the University of California Hospital recently, aged 65, of myocardial infarction and arteriosclerotic hypertensive heart disease.

Edwin Ernest Roberts Ⓢ Washington, D. C.; Georgetown University School of Medicine, Washington, 1894; died November 28, aged 71.

Lisle Benjamin Robinson Ⓢ Atlanta, Ga.; Vanderbilt University School of Medicine, Nashville, Tenn., 1916; also a pharmacist; served with the American Expeditionary Forces during World War I; on the staffs of the Georgia Baptist, Emory, Piedmont and St. Joseph hospitals; died November 25, aged 55, of coronary occlusion.

John P. Rogers, Clarksville, Tenn.; University of Nashville Medical Department, 1907; died in the Protestant Hospital, Nashville, November 7, aged 63, of injuries received last July when a team of horses he was driving ran away.

Eugene Schreiber, Caldwell, Idaho; College of Physicians and Surgeons, Boston, 1911; member of the Idaho State Medical Association; also a pharmacist; member and past president of the chamber of commerce; died November 28, aged 54.

Otto Nicholas Schudde, Ferguson, Mo.; Barnes Medical College, St. Louis, 1898; member of the Missouri State Medical Association; served overseas in the medical corps of the U. S. Army during World War I; lieutenant colonel, medical reserve corps, U. S. Army, not on active duty; at one time affiliated with the Indian Service; formerly health officer of Franklin County; died November 29, aged 75, of myocarditis.

John L. Seabloom Ⓢ Red Oak, Iowa; St. Louis College of Physicians and Surgeons, 1904; served as a captain in the medical corps of the U. S. Army during World War I; died in the Bethesda Hospital, St. Paul, Minn., October 9, aged 70, of acute gastroenteritis.

Howard C. Sellards, Portsmouth, Ohio; Miami Medical College, Cincinnati, 1891; died November 27, aged 77, of heart disease.

Harvey James Skarshaug, Washburn, N. D.; State University of Iowa College of Medicine, Iowa City, 1926; member of the North Dakota State Medical Association; at one time health officer of Fargo, N. D.; died November 30, aged 45.

William Andrew Smith Ⓢ Mansfield, Ohio; Ohio Medical University, Columbus, 1904; served during World War I; died November 22, aged 62, of heart disease.

Elwyn Vincent Strand Ⓢ Bayport, Minn.; University of Minnesota Medical School, Minneapolis, 1929; for many years county coroner; member of the school board; served as health officer of the village of Lake Elmo and Bayport; on the staff of the Lakeview Memorial Hospital, Stillwater; president of the Bayport Realty Company; died November 27, aged 41, of carcinoma of the lungs.

James Alto Ward Ⓢ Birmingham, Ala.; Johns Hopkins University School of Medicine, Baltimore, 1918; specialist certified by the American Board of Internal Medicine; fellow of the American College of Physicians; on the staff and lecturer, Baptist Hospitals; on the staff of the Jefferson Hospital; a member of the executive committee of the board of trustees, Howard College; accidentally drowned at Inland Lake November 11, aged 51.

Myron Anson Warriner, Bridgeport, Conn.; Harvard Medical School, Boston, 1884; died December 18, aged 87.

KILLED IN ACTION

John Elliott Carter, Duxbury, Mass.; Western Reserve University Medical School, Cleveland, 1938; commissioned a first lieutenant in the medical reserve corps, U. S. Army on Jan. 14, 1941 and later a captain; posthumously awarded the Purple Heart; killed in action in the southwest Pacific area July 22, aged 31.



CAPT. JOHN E. CARTER
M. R. C., U. S. Army, 1912-1943

Correspondence

JUVENILE DELINQUENCY

To the Editor:—In the editorial December 25 concerning "Medical Aspects of Juvenile Delinquency" you fail to recognize the broader implications of the problem. Juvenile delinquency actually represents only a part of the larger problem of child guidance. When the behavior of a problem child becomes antisocial, it is then termed juvenile delinquency. When it is considered that over 10 per cent of our induction examinations and over 30 per cent of our army discharges are for neuropsychiatric causes, the more fundamental implications in childhood become obvious. Also as more and more normal men are inducted and more and more abnormal men are recognized, rejected and returned to civil life they not only constitute a serious menace to morale but very poor examples for the impressionable children.

Even in the present emergency the children who display delinquent tendencies usually were problem children and were therefore so predisposed. My own experience, contrary to your statistics, reveals that not more than a third of the children present problems because of environmental influences alone. Prior to the present emergency the figures were closer to a fourth of the total number.

The endogenous or physical-mental factors represent most of the remaining cases, although a goodly number are purely endogenous in origin.

Most delinquency is preceded by truancy. Many of these children suffer from some form of somatic disorder. This may only be an unrecognized error of refraction or an impairment of hearing. I have seen numerous "lazy children" who were actually suffering from an unrecognized cardiac, nephritic or arthritic disorder.

Maladjusted behavior is very frequently due to a neuropathologic condition that predisposes to this type of reaction. Between 1 and 2 per cent of problem children are actually suffering from an incipient psychosis.

Failure to take due cognizance of the psychologic needs of the early years of childhood predisposes to the development of various neurotic manifestations. This emotional maladjustment is too frequently expressed as delinquent behavior.

Gesell has shown how intellectual inadequacies can be recognized in infancy by developmental retardation patterns. Lurie has pioneered in pointing out the direct and indirect effect of endocrine disorders on motivation.

"The hysterical broadside because of the increase in juvenile delinquency" (to paraphrase the editorial) can be warranted if it serves to focus attention on certain needs of our children. This must be done before they develop into candidates for the half million hospital beds in mental institution or those in penal institutions or even the larger number making inadequate adjustments in civil life.

LEONARD M. DUB, M.D., Washington, D. C.

MICROMETHOD

To the Editor:—The discussion in the article by J. T. Peters published in *THE JOURNAL*, January 1, restricts the term micromethod to those procedures requiring the use of no more than 1 drop of blood and hence classifies its blood sulfonamide determination as a micromethod since but 1 drop of blood is used in its procedure. The volume of this drop obtained from either an ear lobe or a finger tip is described to be 0.25 cc.

The micromethod emphasizes its attractiveness by the fact that but 1 drop is necessary and yet, on closer scrutiny, that drop proves to be several drops in terms of what is generally accepted as a drop. Goodman and Gilman (*The Pharmacology*

logical Basis of Therapeutics, p. 1308) state that the U. S. P. standard dropper delivers 20 drops of distilled water at 15 C., which is the equivalent of 1 cc., or 15 minims. One drop therefore becomes equal to approximately 0.05 cc. Pierce and Haenisch (*Quantitative Analysis*, p. 97), in their discussion on volume of drops obtainable from 50 cc. buret tips, also consider the volume of a drop to be approximately 0.05 cc.

If the term "drop" is permitted to be used in a quantitative sense, limits of its volume ought to be agreed on and universally recognized.

HAROLD M. COLEMAN, PH.D., Chicago 15.

EKG OR ECG

To the Editor:—In *THE JOURNAL* for Dec. 25, 1943 Dr. E. B. Krumbhaar objects to the use of EKG and makes propaganda for ECG. Dr. Krumbhaar is mistaken. EKG is the right way of spelling. E K G are the initials of the three Greek words elektron, kardia and gramma; kardia means heart, as we can find in the gospel of St. Matthew, 15: 8, in *Novum Testamentum Graece*, by Nestle, St. Louis, Concordia Publishing House, 1942. Surely St. Matthew knew how to spell kardia.

HUGO STANKA, M.D., Anna, Ill.

[On receiving a copy of Dr. Stanka's letter, Dr. Krumbhaar replied:]

To the Editor:—My suggestion of course assumed, correctly, I believe, that the word to which the abbreviation ECG referred had long since become Anglicized. "Electrokardiogram" is not found in our medical dictionaries any more than "kardiology," "kardiac," "kyst," "kakexia," "kakoethes arguendi" or numerous other words derived originally from the Greek.

As to the line about St. Matthew, I understand that it is not known whether Matthew knew only Aramaic or Greek as well. It reminds one of the good old fundamentalist who insisted on retaining the King James version of the Bible, as opposed to the Authorized, because "the language that was good enough for St. Paul is good enough for me!"

E. B. KRUMBHAAR, M.D., Philadelphia.

VISUAL TEST FOR MALINGERING

To the Editor:—From experience gained partly in induction work, where the factors of limited time and space and the absence of any elaborate equipment are the rule, it is suggested that the use of the so-called naval or "approach" method of recording vision is deserving of wider application as a quick and reliable test for malingering.

In the execution of this method the person under examination is directed to approach a Snellen test chart placed at a distance of 20 feet. If now the examinee insists he cannot read for example beyond the 70 foot type at this distance (20/70 representing a fraction with 20 feet as the numerator and 70 feet as the denominator) and is able at a distance of 10 feet to read the line indicating the 20 foot type (10/20 a fraction having 10 feet as the numerator and 20 feet as the denominator) he is obviously malingering for, by conversion, 10/20 is the equivalent of 20/40, and in each instance a corresponding angle of 10 minutes of arc is subtended.

With a conversion formula (*Arch. Ophth.* 30:138 [July] 1943) and a rationale for the "approach" method of designating vision (*ibid.* 30:377 [Sept.] 1943) available the problem of interpreting and evaluating Snellen symbols is more clearly defined and by the same token affords additional proof of the soundness of conclusions previously outlined.

J. A. C. GABRIELS, M.D., Albany, N. Y.

SUBSTITUTE FOR TALCUM POWDER IN SURGERY

To the Editor:—In *THE JOURNAL*, Dec. 11, 1943, Seelig, Verda and Kidd recommended potassium bitartrate as a substitute for talcum powder in surgery.

Some time ago we commenced a series of experiments using a substitute for talc. The first compound used was starch, selected because of its smoothness and qualities as a dusting agent, as well as its being a carbohydrate which might be broken down into its simpler components in the peritoneal cavity and be utilized. We found, however, that starch could not be sterilized in the usual manner without becoming gelatinized and forming a glaze over the gloves causing them to be stiff and stick together. Despite this it was used for two abdominal operations on one dog, the first consisting in simply handling the bowel with unrinsed gloves, and the second rubbing a small quantity (several grams) on the bowel surface. In neither operation were adhesions formed; no traces of the powder could be found. However, it was discarded because of its inability to withstand proper sterilization.

At this time, while searching for another talc substitute, the Sept. 11, 1943 issue of *THE JOURNAL* contained a communication by Seelig stating that he and his associates had given up the use of starch, which he had recommended in *THE JOURNAL*, April 17, 1943, and were using potassium bitartrate instead and had found it satisfactory. We decided to confirm their findings.

Trial sterilization of the gloves powdered with potassium bitartrate showed that it withstood the sterilization without change and was satisfactory physically. As yet we have noticed no appreciable shortening in the life of the rubber gloves but have done no specific experiments to determine this. No skin sensitivity to the bitartrate has yet appeared.

To date we have performed thirty-four abdominal operations on 10 dogs (sterile procedure). Thirty-four persons have scrubbed and used gloves prepared with potassium bitartrate three times each. In all of these operations the powder was not washed off of the gloves, and in one several grams of the powder was rubbed onto the bowel surface, and in none of these were adhesions found which could be attributed to the powder, nor could traces of the powder be found. None of the dogs showed any toxic manifestations. In several dogs that have been studied post mortem three to four weeks after the fourth operation (abdominal) by second year students, the abdomen has been entirely free of adhesions. This is unusual, since inexperienced students in their first contact with surgery usually handle the bowel excessively. The results obtained with potassium bitartrate are even better than those obtained when using the "wet glove technic," in which no powder is used.

Thus the findings of our small series can be summarized as follows:

1. Starch, although it did not produce adhesions in the peritoneal cavity, was not able to withstand sterilization without undergoing change.
2. Potassium bitartrate intraperitoneally does not cause adhesions.
3. Potassium bitartrate causes no harmful effects even from the absorption of several grams of powder.
4. No skin sensitivities have been found in those using potassium bitartrate as a dusting powder.

The foregoing findings are thus seen to confirm those of Seelig, Verda and Kidd on the use of potassium bitartrate as a surgical dusting powder.

DANIEL C. RIORDAN, M.D.,
Surgical Laboratory, Stanford University
School of Medicine, directed by
F. L. Reichert, Professor of Surgery.

AMINOPHYLLINE DEATHS

To the Editor:—In an article on "Aminophylline Deaths" (*THE JOURNAL*, Dec. 25, 1943, p. 1115) Dr. G. A. Merrill reported 3 deaths during or shortly after intravenous injections of 0.25 Gm. of aminophylline. The impression is given that this drug is very dangerous in cases of cardiac failure and in bronchial asthma. Two of these patients had heart disease (coronary and cardiac decompensation). The third patient was 73, with a blood pressure of 200/90, pulse rate 120, and heart sounds of poor quality. The diagnosis of bronchial asthma was made, but it is obvious that hypertensive cardiovascular disease also existed. Therefore all 3 patients had heart disease.

No one will question the possible danger of intravenous therapy in acute heart disease, especially acute coronary occlusion. The intravenous use of aminophylline in heart disease has not met with universal approval and it undoubtedly has its dangers; fatalities from its use do occur.

But the intravenous administration of aminophylline in bronchial asthma, given slowly, is practically free from danger. I have given many hundreds of these injections at Wesley Memorial Hospital, in the office and in the home and have yet to see any dangerous reaction beyond an occasional and temporary episode of nausea. The drug, when given by vein, quickly helps almost all patients with bronchial asthma and is especially indicated for an asthmatic patient who has had too much epinephrine.

The intravenous use of aminophylline should therefore be continued in cases of uncomplicated bronchial asthma.

LEON UNGER, M.D., Chicago.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

BOARDS OF MEDICAL EXAMINERS BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in *THE JOURNAL*, Jan. 22, p. 257.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: *Part III*. Various centers, January. Sec., Dr. J. S. Rodman, 225 S. 15th St., Philadelphia.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY: *Oral. Part II*. Chicago, June 12-16. Final date for filing application is March 12. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Written*. Various large cities, May 8. *Oral*. Chicago, June 9-10. Final date for filing application is April 1. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF INTERNAL MEDICINE: *Written*. Various centers, Oct. 16. Candidates in military service may take examination at their place of duty. Final date for filing application is August 15. Asst. Sec., Dr. W. A. Werrell, 1301 University Ave., Madison, Wis.

AMERICAN BOARD OF OBSTETRICS & GYNECOLOGY. *Written. Part I*. Various centers, Feb. 12. Candidates in military service may take Part I at their place of duty. *Oral. Part II*. Pittsburgh, June 7-13. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF OPHTHALMOLOGY: Chicago, Oct. 5-7. Sec., Dr. S. Judd Beach, P. O. Box 1940, Portland, Me.

AMERICAN BOARD OF OTOLARYNGOLOGY: *Oral*. New York City, June 1-4. Sec., Dr. Dean M. Lierle, University Hospitals, Iowa City, Ia.

AMERICAN BOARD OF PEDIATRICS: *Written*. Locally, Feb. 4. *Oral*. Philadelphia, March 25-26, and San Francisco, May 6-7. Sec., Dr. C. A. Aldrich, 115½ First Ave. S.W., Rochester, Minn.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: *Written*. Various centers, March 31. *Oral*. Philadelphia, May 12-13. Final date for filing application is Feb. 29. Sec., Dr. Walter Freeman, 1028 Connecticut Ave. N.W., Washington, D. C.

AMERICAN BOARD OF RADIOLOGY: *Oral*. Chicago, Feb. 15-17. Sec., Dr. Gilbert J. Thomas, 1409 Willow St., Minneapolis.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Dental Practice Acts: Deceptive Advertising by Operator of Chain of Dental Offices.—Campbell, who was licensed to practice dentistry in Washington and in California, conducted a chain of twelve or more dental offices, one of which was in Seattle and the rest in California. At his Seattle office licensed dentists, resident in the state of Washington, were employed by him and conducted by far the greatest part of the practice of dentistry carried on there. Campbell visited his Seattle office about once every two months, and only on those infrequent occasions was he present in the state or did he personally practice dentistry in the state. Proceedings to revoke his license to practice dentistry in Washington were instituted on the ground that in the conduct of his Seattle office he used false and misleading advertising the tendency of which was to deceive the public into believing that he was personally doing the things necessary to be done as a part of the practice of dentistry in that office. From an order of the director of licenses revoking his license Campbell appealed to the superior court for Thurston County, which, after hearing the matter *de novo* on the record before it, in effect affirmed the order of the director, and Campbell appealed to the Supreme Court of Washington.

Campbell's principal contention was that the trial court erred in authorizing the cancellation of his license. The court then discussed in detail the evidence adduced at the original hearing. Aside from the stipulation between counsel, said the court, that evidence consisted entirely of a series of advertisements which Campbell periodically had inserted in various newspapers in Seattle and which the state contends deceived or tended to deceive the public. In a prominent position in these advertisements appeared Campbell's picture, immediately above which were the words "Dr. Campbell says," and to the side of it was a circular diagram containing the exordium: "*I prefer that you use my No Money Down Plan instead of paying cash.*" The words which are italicized were in longhand style, while the remainder of the advertisement was in heavy black type. The advertisements were so arranged with reference to the picture as to make it appear that the words therein were being uttered by Campbell. At the bottom of the advertisements was the announcement "Dr. J. C. Campbell, Dentist, 1520 Westlake." The question then is, continued the court, whether or not these advertisements contravene the provisions of the dental practice act that make it unlawful for any person "in any way to advertise in print any matter with a view of deceiving the public, or in any way that will tend to deceive or defraud the public." Campbell's purpose in inserting these advertisements in the public press was, of course, to attract the attention of the public and thereby to solicit its patronage. The advertisements, it will be observed, are highly personalized. First, there is the picture of Campbell. Then, the individual thus pictured is represented as speaking personally and directly to the reader. Then at the conclusion of the advertisement is the name of the individual who has thus spoken. The advertisements, taken as a whole, convey the idea that Campbell is an independent practitioner, not only owning the dental office but actually and personally conducting or immediately supervising its entire operations. There is no mention or indication of the fact that the office is but one of twelve or more similar offices, all except this particular one being in the state of California and requiring a corresponding amount of Campbell's time and attention. There is no suggestion that the Seattle office constitutes a clinic, company or an association of dentists. For aught that appears in the advertisements, the office is operated and conducted personally by a single dentist. The reader of the advertisement is induced or invited to believe that, if he responds thereto, he will receive Campbell's personal attention. At least it can be said that such advertisements "will tend to deceive or defraud the public" in that respect. As was stated in *Campbell v. State*, 12 Wash. (2d) 459, 122 P. (2d) 458; J. A. M. A. 119:584 (June 13) 1942, wherein was involved

the right of this same dentist to open and conduct another dental office in the city of Tacoma under his general system of operation:

The relationship between dentist and patient is inherently personal in the highest degree. Certainly it is within the province of the legislature to protect the public against all forms of fraud and deception tending to conceal the professional identity of the dentist who is, in fact, rendering the service in the particular office frequented by one in need of dental assistance. By the practice denounced by the act [the Washington dental practice act] the public may be unwittingly deprived of a personal relationship which may rightfully be expected, and another personality substituted therefor. The use of the name of a certain dentist as conducting an office for the practice of dentistry should mean something more than merely physical ownership of the office, or the right to use the name, which may have a value because of long continued use or commercial advertising.

The trial committee that acted for the director of licenses in the original hearing and the superior court for Thurston County on a rehearing of the matter concluded that these advertisements had a tendency to deceive the public. We accept those findings and conclusions as correct.

Campbell next argued that the charges against him have no foundation in fact because there was no evidence that anybody was actually deceived by the advertisements referred to. Manifestly, answered the court, it would have been practically impossible for the state to ascertain and interview the many persons who may have visited Campbell's office in response to his newspaper advertising. It was not incumbent on the state to produce such evidence. In any event, the advertisements speak for themselves and reveal their own peculiar tendency to deceive the public in the respect referred to.

Finally, Campbell contended that the provisions of the dental practice act under which the proceedings against him were instituted are unconstitutional because of ambiguity, vagueness and uncertainty. Whatever may be the weight on this question of out of state authorities cited by Campbell to sustain his contention, said the court, we need go no further than to consult our own decisions in Washington in order to uphold the constitutionality of the statute under consideration. In *State Board of Medical Examiners v. Jordan*, 92 Wash. 234, 158 P. 982, this court dealt with a statute that made unprofessional conduct a ground for revoking a license to practice medicine and which, in defining such misconduct, included the following: "Third. All advertising of medical business which is intended or has a tendency to deceive the public or impose upon credulous or ignorant persons, and so be harmful or injurious to public morals or safety." It was contended there, as it is here, that the statute was uncertain, furnishing no standard by which the propriety or impropriety of questioned conduct could be measured. This court there said:

The one [provision of the statute quoted above] relating to advertisement cannot well be made more specific. To describe in express terms a faulty advertisement is practically to instruct the defendant how to evade it, and as to the limitless variations of language, symbols and verbal or pictorial allurements, no human ingenuity could possibly anticipate and forestall them.

Again, in *State Board of Medical Examiners v. Macy*, 92 Wash. 614, 159 P. 801, the same statute involved in the Jordan case was held not to be "void or unconstitutional because of its vagueness or uncertainty." We hold, continued the court, that the provisions of the dental practice act, in effect, authorizing revocation of a license of a dentist advertising in print any matter with a view of deceiving the public, or in any way that will tend to deceive or defraud the public, are not unconstitutional because of ambiguity, vagueness or uncertainty.

The order of the director revoking Campbell's license to practice dentistry in Washington was affirmed.—*In re Campbell*, 142 P. (2d) 492 (Wash., 1943).

Society Proceedings

COMING MEETINGS

Annual Congress on Industrial Health, Chicago, February 15-16. Dr. Carl M. Peterson, 535 N. Dearborn St., Chicago 10, Secretary.
Annual Congress on Medical Education and Licensure, Chicago, February 14-15. Dr. Victor Johnson, 535 N. Dearborn St., Chicago 10, Secretary.

New Orleans Postgraduate Medical Assembly, New Orleans, March 6-9. Dr. Joseph S. D'Antoni, 1430 Tulane Ave., New Orleans 13, Secretary.
Society of University Surgeons, Nashville, Tenn., February 10-12. Dr. Alexander Brunschwig, 950 East 59th St., Chicago, 37, Chairman, Program Committee.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1934 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Public Health, New York

33:1309-1386 (Nov.) 1943

- Immediate Wartime Outlook and Indicated Postwar Conditions with Respect to Control of Venereal Diseases. T. B. Turner.—p. 1309.
- *Fatal Staphylococcal Intoxication from Goat Milk. L. A. Weed, A. C. Michael and Rolla N. Harger.—p. 1314.
- Sanitary Privy and Its Relation to Public Health. E. S. Tisdale and C. H. Atkins.—p. 1319.
- Further Studies on One Type of Paracolon Organism. C. A. Stuart and R. Rustigian.—p. 1323.
- Neutralization of SK Murine Poliomyelitis Virus and of Theiler's Virus of Mouse Encephalomyelitis by Human Sera. E. Seligmann and C. W. Jungblut.—p. 1326.
- Wartime Health Education in Secondary Schools. Ruth E. Grout.—p. 1333.
- Health Education in Action. A. Oppenheim.—p. 1339.
- Postwar Malaria Prevention by County Health Department. W. N. Sisk.—p. 1343.
- Removal of Poliomyelitis Virus from Sewage by Activated Sludge Process and the Separation from Sludge of an Antibacterial and Antiviral Substance. H. J. Carlson and C. F. McKhann.—p. 1347.
- Public Health Significance of U. S. Cadet Nurse Corps. Lucile Petry.—p. 1353.

Staphylococcal Intoxication from Goat Milk.—Weed and his associates present epidemiologic data on a familial outbreak in which 3 patients developed food intoxication by drinking milk of a goat suffering from an acute suppurative mastitis due to *Staphylococcus aureus*. Two of the patients (3 and 4 years old) died within twenty-four hours after each drank $\frac{1}{4}$ pint (250 cc.) of the milk. Individuals who consumed the cooked milk did not develop symptoms. The goat died within twenty-four hours after the milking related to the onset of symptoms. Material taken from the udder post mortem reproduced the symptoms in kittens. The evidence suggests the possibility that if an enterotoxin was present it was thermolabile.

Annals of Surgery, Philadelphia

118:761-920 (Nov.) 1943

- *Surface Treatment of Burns: Comparison of Results of Tannic Acid, Silver Nitrate, Triple Dye and Vaseline or Boric Ointment as Surface Treatments in 150 Cases. G. H. A. Clowes Jr., C. C. Lund and S. M. Levenson.—p. 761.
- *Gunshot Wounds of Abdomen: Survey of 238 Cases. D. C. Elkin and W. C. Ward.—p. 780.
- Principles Underlying the Operative Approach to Treatment of Myocardial Ischemia. C. S. Beck.—p. 788.
- Clinical Appraisal of the Beck Operation. H. Feil.—p. 807.
- Total Gastrectomy by the Transthoracic Approach: Report of 7 Cases. R. H. Sweet.—p. 816.
- Carcinoma of Duodenum: One Stage Radical Pancreaticoduodenectomy, Preserving the External Pancreatic Secretion: Case Report. C. G. Child.—p. 838.
- New Concept Regarding Origin of So-Called Primary Carcinoma of Hyperplastic Thyroid. E. Goetsch.—p. 843.
- Carcinoma of Breast: II. Criteria of Operability. C. D. Haagensen and A. P. Stout.—p. 859.
- *Immediate Effects on Renal Function of Onset of Shock Due to Partially Occluding Limb Tourniquets. A. C. Corcoran, R. D. Taylor and I. H. Page.—p. 871.
- Primary Osteogenic Sarcoma of Bladder: Complete Review of Sarcomas of Bladder. A. R. Crane and R. G. Tremblay.—p. 887.
- Meningioma: Case Report. C. Pilcher.—p. 909.
- Anterior Sacral Meningocele: Report of 3 Cases. F. P. Shidler and V. Richards.—p. 913.

Surface Treatment of Burns.—Clowes and his associates studied 150 cases of burns, comparing the results following surface applications of ointment gauze dressings, tannic acid-silver nitrate and triple dye. There were two slight clinical infections in the 75 patients with second degree burns and no fatalities. Edema of the face disappeared rapidly without application of pressure. Skin healing of second degree burns of all

areas except the back took place a few days earlier if ointment of triple dye was used than if tannic acid was used. Skin healing of second degree burns of the back took place a few days earlier if petrolatum gauze or boric acid ointment was used for treatment than if either tannic acid-silver nitrate or triple dye was used. Skin healing of second degree burns of the face was faster and of the back slower than of all other parts of the body. Fifty-seven patients had mixed second and third degree burns with 9 per cent or less of body area involved in third degree burn. There were 19 instances of clinical infection among these patients, but none died. Eighteen patients with more than 10 per cent of surface area involved by a third degree burn either died or were seriously ill. Two died of shock or other complications within one and five days respectively. All 5 patients with 10 or 15 per cent of third degree burns survived, while only 3 of 11 with 20 per cent or larger areas survived. The statistics suggest, but do not prove, that petrolatum gauze and triple dye treatment were safer for large third degree burns than treatment with tannic acid-silver nitrate. Areas treated with petrolatum gauze became free from slough and were grafted earlier than areas treated with the other two methods.

Gunshot Wounds of the Abdomen.—Elkin and Ward report observations on 238 patients admitted between 1937 and 1943 to the surgical service of the Emory University Hospital with the provisional diagnosis of gunshot wound of the abdomen. All the patients were Negroes. There were 29 shotgun wounds, while 209 were produced by rifle or pistol. Seventeen patients died immediately after admission, and 4 died on the operating table. There were 94 postoperative deaths among 199 patients operated on. Thirty-three of the operative group were given sulfanilamide. Fourteen received the drug subcutaneously and 19 received it both subcutaneously and intraperitoneally; the number of deaths was 6 and 5 respectively, making a mortality of 33 per cent. The drug seemed to be of considerable value in controlling the peritonitis. Wounds of entrance and exit were excised, treated with sulfanilamide crystals and packed. The contents of the peritoneal cavity were aspirated. Usually the cecum was examined first; the small intestine was then inspected from the ileocecal junction to the ligament of Treitz. Perforations were repaired as they were found. When resection was necessary, clamps were placed on the open ends as a landmark while the remainder of the small intestine was examined. The large intestine was next explored, and after that the stomach and retroperitoneal structures. Moderate size retroperitoneal hematomas were left undisturbed unless they involved the kidneys, pancreas or duodenum. Minor lacerations of the kidney or spleen can usually be sutured; otherwise these organs should be removed. Most wounds of the liver were not bleeding at the time of exploration. Perforations of the diaphragm (on the left) should always be closed to avoid the possibility of herniation. The mortality rate in gunshot wounds of the abdomen has remained high and will probably continue so. The severity of the wound, the time required to reach the hospital and the physical status of the patient are uncontrollable factors. Type of anesthesia, prompt and complete exploration, with repair of damage, proper use of chemotherapy and postoperative management are factors which are controllable and important.

Effects on Renal Function of Shock Due to Limb Tourniquets.—According to Corcoran and his associates, changes of renal blood flow and function during shock are of current interest since they may help explain the pathogenesis of renal failure in "traumatic anuria" (crush syndrome). The authors describe variations in renal hemodynamics and function which may occur during the onset of shock in anesthetized dogs after renal denervation, after splenectomy and during transfusion of blood. The choice of partially occluding limb tourniquets as a method of producing shock was made because of its simulation of the conditions under which clinical traumatic anuria may occur and because it permits continuous observation of systemic changes. Each experiment consisted of a control period of thirty minutes of observation, following which partially occluding limb tourniquets were applied. The observations were continued for about four hours, when the tourniquets were removed and the experiment continued for another eighty minutes or more. Some of the animals were killed at the end

of this time, but the majority died eight to fourteen hours after the application of the tourniquets. The observations made during the experiments include the renal clearances of diodrast and inulin, urine volume, arterial pressure and hematocrit index (method of Wintrobe). The authors found that the onset of shock due to the four hour application of partially occluding hind limb tourniquets to anesthetized dogs causes a definite depression of renal function, which is the result of reduction in renal blood flow. Hypotension is only a minor and inconstant element in this decrease in renal blood flow; increased renal resistance is much more important. Among the causes of increased renal resistance, blood viscosity due to a rise of hematocrit index is not significant, for splenectomy, which prevents the increase of hematocrit, does not interfere with the reduction of renal blood flow. Renal vasoconstriction too accounts for only a small proportion of the renal ischemia which follows tourniquet application and release, as is shown by renal denervation. The decrease in renal blood flow seems to be due to some humorally circulating vasoconstrictor substance. Such a material was demonstrable in the plasma of several animals in which its presence was associated with increased renal resistance, predominantly at the glomerular efferent arterioles. With injury, as after the release of tourniquets, the diodrast extraction ratio may be depressed, so that normal interpretations cannot be given to changes in plasma diodrast clearance and filtration fraction. The renal vasoconstriction associated with the onset of shock serves to explain transient signs of renal irritation. Although it may play a part in the genesis of "traumatic anuria" ("crush syndrome") it alone does not reproduce this state.

Archives of Dermatology and Syphilology, Chicago

48:479-578 (Nov.) 1943

- Histopathologic Study of Psoriasis. J. W. Burks and H. Montgomery.—p. 479.
- Bubonulcus in Granuloma Inguinale. N. Sobel and N. Pensky.—p. 494.
- Inhibitory Effect of Monochloromercuricarsenol on Growth of Pathogenic Fungi. C. E. Georgi.—p. 497.
- *Treatment of Tinea with Ethyl Chloride. N. Bograd.—p. 511.
- Schematic Classification of Animal Organisms Causing Dermatologic Diseases. M. E. Obermayer.—p. 512.
- Results of Questionnaire on Patch Tests: Analysis of Answers by Two Hundred and Eleven Dermatologists and Fifty-Five Industrial Physicians. J. G. Downing.—p. 514.
- Vitiligo in Three Siblings. K. Jaenicke.—p. 519.
- Congenital Auricular Fistula. F. T. Becker.—p. 520.
- *Fixed Eruption, Conjunctivitis and Fever from Sulfathiazole. W. Director.—p. 523.
- CII. Sporotrichosis Following a Mosquito Bite: Description of Lesions in Girl of Indian and French Descent. M. Moore and G. Manting.—p. 525.
- Traumatic Marginal Alopecia Due to Traction on Hair: Comparative Study of Alopecia Limbaris Frontalis of Sabouraud. O. G. Costa and M. A. Junqueira.—p. 527.

Treatment of Tinea with Ethyl Chloride.—Bograd states that treatment of lesions of the tinea group with ethyl chloride has given uniformly excellent results in the South Pacific. There are no contraindications to its use, even though the lesions may be covered by pustular eruptions due to secondary infections. The length of treatment depends solely on the age of the infection and not on the area it covers. All of it must be treated at one sitting. No other drug or dye should be used in conjunction with ethyl chloride. The ethyl chloride is sprayed on only until the temperature of the skin has been lowered sufficiently to bring out the white surface. Any tinea lesion, regardless of where it appears and whether it is acute or chronic, may be treated with ethyl chloride. The method is superior to that with any fungicide now used.

Fixed Eruption, Conjunctivitis and Fever from Sulfathiazole.—Director uses the term "fixed" in the sense that the dermatitis is confined to the same sites on recurring attacks. A sailor aged 34 entered the hospital on March 6 with a tender mass in the left groin of three weeks' duration and a penile sore of eight days' duration. Dark field examinations of material from the penile lesion did not reveal *Treponema pallidum*, and Kahn tests were negative. The Frei reaction was negative on March 9 and positive on March 29, 1943, establishing the diagnosis of lymphogranuloma venereum. The patient was kept in bed and given 3 Gm. of sulfathiazole daily from March 16 through March 20, when the mass in the left groin subsided. On March 17, after one day of sulfathiazole therapy, several

dusky red, edematous macules appeared on both sides of the neck. On the next day the edema increased. On March 20 new macules broke out; others continued to appear until March 24. Small discrete red papules also appeared on the forehead, and both conjunctivas became diffusely injected. Sulfathiazole was discontinued on March 24, and the lesions began to fade by the next day; by March 26 they were almost completely gone, leaving a faint brown stain. On April 5 there was a recurrence of the swelling of the left inguinal lymph nodes. The patient was again given sulfathiazole from April 5 through April 7. At noon on April 7 there was a recurrence of the eruption on the neck and face. On April 19, prior to his discharge from the hospital, the patient was given 0.5 Gm. of sulfathiazole. Elevation of temperature accompanied by malaise appeared first after an interval of four hours and fifteen minutes and rose to 102.6 F. in two hours; remaining on this plateau for three hours and then subsiding to normal in six hours, a total febrile period of eleven hours. The conjunctival injection and dermatitis of the fixed sites on the neck and forehead appeared together. The injection disappeared completely in twenty-four hours. The same cutaneous sites previously affected flared into bright erythematous macules but did not become edematous. The dermatitis subsided completely in thirty-six hours. The patient did not recall ever having taken sulfathiazole before. The latent period of sensitization therefore could not have been more than twenty-four hours, since the original cutaneous lesions appeared one day after the first dose of the drug.

Arkansas Medical Society Journal, Fort Smith

40:103-116 (Nov.) 1943

The Doctor's Heart. J. H. Musser.—p. 103.

40:117-138 (Dec.) 1943

Cardiac Arrhythmias. O. C. Melson.—p. 117.

Cancer Research, Baltimore

3:809-928 (Dec.) 1943

- Heterologous Transplantation of Embryonic Mammalian Tissues. H. S. N. Greene.—p. 809.
- Influence of Egg White and Avidin Feeding on Tumor Growth. C. J. Kensler, C. Wadsworth, K. Sugiyama, C. P. Rhoads, K. Dittmer and V. du Vigneaud.—p. 823.
- Effect of Pyridoxine on Tumor Growth. B. E. Kline, H. P. Rusch, C. A. Baumann and P. S. Lavik.—p. 825.
- Free Choice Dietary Study of Tumor Bearing Rats. W. M. Cahill, W. F. Dunning and A. H. Smith.—p. 830.
- Vitamin A and the Toxic Action of Dibenzanthracene on Tissues. A. Goerner and M. Margaret Goerner.—p. 833.
- Technic for Production of Hypothermia in Albino Rats. R. M. Hill, A. G. Ware and F. H. Schultz.—p. 839.
- Effects of Lowered Body Temperatures on Methylcholanthrene Fibrosarcomas in Rats. R. M. Hill, E. K. Rutledge, A. G. Ware, F. H. Schultz and W. H. Livingston.—p. 841.
- Determination of Carcinogenic Hydrocarbons in Animal Tissue: Two Condition Fluorometry. J. A. Miller and C. A. Baumann.—p. 849.
- Sarcoma Producing Factor Extractable from Transplanted Rat Fibrosarcomas. P. M. Aptekman, Helen Dean King and Margaret Reed Lewis.—p. 856.
- Estrogen Administration to Aged Female Monkeys with No Resultant Tumors. E. T. Engle, C. Krakower and C. D. Haagensen.—p. 858.
- Rhabdomyosarcoma: Rat Tumor 92, Institute of Cancer Research, Columbia University, New York. W. H. Lewis.—p. 867.
- Retention of Radioactive Phosphorus in Leukemic Patients. S. Warren.—p. 872.

Endocrinology, Springfield, Ill.

33:261-332 (Nov.) 1943

- Bioassay of Adrenocorticotrophic Hormone. Miriam E. Simpson, H. M. Evans and C. H. Li.—p. 261.
- Factors Affecting Action of Antigonadotropic Sera in Immature Rats. W. H. McShan, H. R. Wolfe and R. K. Meyer.—p. 269.
- Assay of Adrenal Cortical Extracts in Adrenalectomized Rats Exposed to Cold. A. Roos.—p. 276.
- Studies of Zimmermann Reaction: Factors Affecting Color Intensity; Relation of Molecular Structure to Color Production. L. P. Hansen, A. Cantarow, A. E. Rakoff and K. E. Paschkis.—p. 282.
- Color Measurement of Sexual Skin of Macacus Rhesus by Munsell System of Color Annotation. R. Cleveland, Susan Wilkes and Grace Sabotka.—p. 289.
- Alloxan Diabetes in Dog. M. G. Goldner and G. Gomori.—p. 297.
- Studies on Inactivation of Estradiol by Liver. A. Cantarow, K. E. Paschkis, A. E. Rakoff and L. P. Hansen.—p. 309.
- Effects of Estrone, Ascorbic Acid and Testosterone Propionate on Nitrogen Storage and Insulin Requirement in Dogs. O. H. Gaebler and S. M. Tarnowski.—p. 317.
- Effects of Adrenal Cortical Compounds on Lactation. W. O. Nelson, R. Gaunt and Malvina Schweizer.—p. 325.

Journal of Experimental Medicine, New York

78:327-424 (Nov.) 1943

- Pneumococcal Capsular Swelling Reaction, Studied with Aid of Electron Microscope. S. Mudd, F. Heinmets and T. F. Anderson.—p. 327.
- Production of Scurvy-like Condition by Feeding of Compound Structurally Related to Ascorbic Acid. D. W. Woolley and L. O. Kramnitz.—p. 333.
- Yield of Rabies Virus in Chick Embryo. B. Sigurdsson.—p. 341.
- Immunologic Response to Influenza Virus Infection as Measured by Complement Fixation Test: Relation of Complement Fixing Antigen to Virus Particle. W. F. Friedewald.—p. 347.
- Kinetic Analysis of Renin-Angiotensin Pressor System and Standardization of Enzymes Renin and Angiotensinase. A. A. Plentl and I. H. Page.—p. 367.
- *Bactericidal Action of Propylene Glycol Vapor on Micro-Organisms Suspended in Air: II. Influence of Various Factors on Activity of Vapor. T. T. Puck, O. H. Robertson and H. M. Lemon.—p. 387.
- Studies of Antigenic Differences Among Strains of Influenza A by Means of Red Cell Agglutination. G. K. Hirst.—p. 407.

Bactericidal Action of Propylene Glycol Vapor on Micro-Organisms in Air.—Puck and his associates state that pneumococci, hemolytic streptococci, staphylococci, Haemophilus influenzae and other organisms, as well as influenza virus, when sprayed into atmospheres containing propylene glycol vapors were killed so rapidly that no micro-organisms or virus could be recovered from the test chamber. Propylene and triethylene glycols are relatively nontoxic and in vapor form are odorless, tasteless and nonirritating to the respiratory mucosa. The authors studied factors which influence or limit the action of propylene glycol vapor. The killing process was more effective when both the total number of air borne droplets and the number of organisms in the bacterial suspension were small. A temperature below 80 F. and an atmospheric relative humidity between 45 and 70 per cent were found to constitute the most favorable conditions for the lethal action of the vapor. Equally strong bactericidal action was obtained when propylene glycol was dispersed in an 800 cubic foot room as occurred in chambers of 2 cubic foot capacity. Susceptibility to vapor action of bacteria resuspended in saliva was just as great as when broth was used as the suspending medium. Both partially and completely dehydrated bacteria succumbed to the effects of the vapor. When unsterile dust collected from inhabited rooms was dispersed into the air, little reduction of the natural microbic population contained in this material was observed. The minimum glycol concentration necessary for effective bactericidal action on various micro-organisms was as follows: Pneumococci were killed by amounts of propylene glycol as low as 1 Gm. in 20 million cc. of air; concentrations of 1 to 5 million to 1 to 10 million were required to produce the same degree of killing of streptococci and staphylococci.

Journal of Lab. and Clinical Medicine, St. Louis

28:1655-1774 (Nov.) 1943

- Absorption and Excretion of Methylsalicylate Administered by Inunction. R. Beutner, B. Calesnick, E. Powell and L. Bortin.—p. 1655.
- Systemic Allergic Reaction Induced by Yellow Fever Vaccine. H. Swartz.—p. 1663.
- Pharmacology of Two Water Soluble Vitamin K-like Substances. J. J. Smith, A. C. Ivy and R. H. K. Foster.—p. 1667.
- Effects of Vitamin B Deprivation on Spontaneous Activity of Rat. A. L. Bloomfield and M. L. Tainter.—p. 1680.
- *Reaction of Leukemic Patients to Sulfonamides. E. L. Amidon.—p. 1691.
- Effects of Various Intensities of Light on Certain Laboratory Animals. M. E. Maun and L. H. Domier.—p. 1696.
- Urease Activity of Proteus and Salmonella Organisms. W. W. Ferguson and A. E. Hook.—p. 1715.
- Cephalin Flocculation Test in Jaundice. P. A. Kirschner and S. I. Glickman.—p. 1721.
- Observations on Ingestion of Methyl Cellulose and Ethyl Cellulose by Rats. W. Deichmann and S. Witherup.—p. 1725.

Reaction of Leukemic Patients to Sulfonamides.—Livingston and Moore administered sulfapyridine to 6 patients with lymphatic leukemia and reported a definite change in the total number of lymphocytes in the peripheral blood. Amidon reports 4 cases of lymphatic leukemia in which he employed sulfonamides. The first patient reacted promptly to sulfanilamide and sulfathiazole by a drop in the total white cells followed by clinical improvement from a moribund state to that of comparative health. Contrary to prevailing teachings, the lymphocytes were decreased while the number of neutrophils remained nearly constant. Because of the prolonged leukopenia it was thought best to discontinue the sulfonamides. Patient 2

showed the smallest hematologic change after the administration of sulfathiazole. He received only 6 Gm. over a four day period. The sudden vascular collapse after the administration of sulfathiazole is difficult to explain. The third patient, like the first, had the acute form of the disease and rallied from a nearly moribund state after sulfathiazole was given. The fourth patient was at the point of death on admission. He responded so well to sulfanilamide that he was able to be discharged from the hospital and was able to return to his job as janitor. On this admission he responded well to sulfathiazole but failed to show any change when sulfadiazine was given.

Journal of Urology, Baltimore

50:515-640 (Nov.) 1943

- Experiences with Deming Nephropexy. A. I. Dodson.—p. 515.
- Partial Resection of Kidney: Report of 13 Cases. C. P. Mathé.—p. 525.
- *Renal Trauma and Its Relation to Hypertension. W. F. Braasch and G. W. Strom.—p. 543.
- Lateral Nephrectomy: Report of 2 Cases; Cortical Carcinoma of Adrenal Gland; Perineural Blastoma. L. Herman.—p. 550.
- Crossed Renal Ectopia: Report of 2 Additional Cases. H. A. Zide and E. J. Maher.—p. 560.
- Sarcoma of Kidney. W. Weisel, M. B. Dockerty and J. T. Priestley.—p. 564.
- Experimental Use of Vitallium Tubes in Ureterointestinal Anastomosis. A. R. Stevens and J. W. Lord Jr.—p. 574.
- Autopsy Twenty-Two Years After Cutaneous Ureterostomy for Tuberculosis. E. L. Keyes.—p. 580.
- Late Results Following Transplantation of Ureters into Rectosigmoid. W. E. Lower.—p. 581.
- Tumor of Testicle; Analysis of Results Obtained in 50 Patients Treated by X-Ray Therapy. G. G. Smith.—p. 585.
- Benign Prostatic Obstruction in Young Adult. J. K. Ormond and R. B. Roth.—p. 590.
- Intraprostatic Injection of Pitressin and Adrenalin in Control of Bleeding During Transurethral Resection: Preliminary Report. C. D. Creevy.—p. 593.
- Retrothel Sarcoma of Prostate Gland: Report of Case. J. D. Kirshbaum, H. S. Larkin and H. Culver.—p. 597.
- *Orthostatic Albuminuria. C. L. Prince.—p. 608.
- Intravenous Urokinography: Preliminary Report. B. Hughes.—p. 621.
- Clinical Use of Sulfadiazine in Nonspecific Urinary Tract Infections: Study of 100 Cases. L. W. La Towsky.—p. 625.
- Dawn of Genitourinary Surgery. A. Castiglioni.—p. 632.

Renal Trauma and Its Relation to Hypertension.—Braasch and Strom analyzed cases with clinical evidence of previous renal trauma in the records of the Mayo Clinic. There were 50 cases with a definite history of renal injury to a presumably normal kidney in which the blood pressure was recorded at some time during the patient's examination at the clinic. Nephrectomy was performed in 5 of these. Hypertension existed in 3 of these 5 cases. Following removal of the kidney, the blood pressure returned to normal. In the other 2 cases the preoperative blood pressure was normal. The small number of patients with renal injury who underwent nephrectomy corroborates the value of conservative treatment. In 38 of 45 cases in which no operation was indicated the blood pressure was normal subsequent to renal injury. In 6 cases the degree of hypertension was moderate and the hypertension either existed prior to renal injury or was explained by factors other than renal. In only 1 of these cases was renal trauma considered a possible factor in the production of hypertension. The changes in the renal tissue following injury usually do not cause hypertension. Hypertension due to renal trauma usually occurs in cases in which there is a secondary renal infection. This is in keeping with the fact that changes in renal tissues secondary to chronic infection have been noted in most renal lesions which are known to cause hypertension. There was 1 exception, a case of hypertension observed nine months after injury, in which an encapsulated hematoma was compressing a large portion of the kidney without infection. When hypertension exists following renal injury it may be difficult to determine whether the injury is an etiologic factor unless the blood pressure and other clinical records prior to injury are available.

Orthostatic Albuminuria.—Prince studied 5 young men who were rejected by medical examining boards because albumin was found in their urine. Four of the patients have since been accepted for active duty in the armed services after thorough examination proved that the albuminuria was orthostatic in

character. In the fifth case the albuminuria was found not to be orthostatic. A diagnosis of orthostatic albuminuria cannot be made immediately after a routine examination and a few urinalyses. Chronic glomerulonephritis in a latent stage, the condition most frequently confused with orthostatic albuminuria, must be ruled out. The author examines repeatedly for albumin the first morning specimen of urine voided immediately on rising. He considers normal intravenous phenolsulfonphthalein, dilution and concentration tests to be sufficient evidence of satisfactory renal function, although urea clearance and other renal function tests are frequently used as additional proof. A normal blood nonprotein nitrogen or urea nitrogen is essential. The importance of the intravenous urogram cannot be overemphasized. A normal intravenous urogram is absolutely essential before a diagnosis of orthostatic albuminuria can be made. The "lordotic" tests are most important and extremely helpful. Orthostatic albuminuria is quite harmless and usually disappears shortly after puberty. It has no effect on general health or longevity. Albuminuria of this type requires no treatment or curtailment of activity. There is no reason why young persons with orthostatic albuminuria should not be allowed to serve with the armed forces.

Medical Annals of District of Columbia, Washington 12:373-416 (Oct.) 1943

- Electrocardiographic Changes Following Metrazol Convulsions: Effect of Prolonged Anoxemia. W. D. Claudy.—p. 373.
Common Skin Diseases of Children Seen in Private Practice. W. F. Burdick.—p. 383.
Demerol, a New Analgesic. C. S. White.—p. 388.
Functional Nervous Disorders in General Practice. J. R. Cavanagh.—p. 391.

Missouri State Medical Assn. Journal, St. Louis 40:339-362 (Nov.) 1943

- Certain Considerations in Management of Small Intestinal Obstruction. C. J. Hunt.—p. 339.
Congenital Diaphragmatic Hernia: Report of Case. J. A. Ossman.—p. 341.
What Constitutes Adequate Examination? E. C. Funsch.—p. 343.
Industrial Hazards. W. M. Macon.—p. 344.
Continuous Caudal Anesthesia in Obstetrics. P. H. Lorhan.—p. 346.
Continuous Spinal Anesthesia. J. McNearney.—p. 348.

40:363-390 (Dec.) 1943

- Blood Transfusions and Blood Substitutes. R. O. Muether.—p. 363.
Pulmonary Lesions of Sulfonamide. H. Pinkerton.—p. 364.
Corbner Plan and Medical Examiner System: Brief Comparative Survey of Statutory Provisions in England and Several American States. H. S. Breyfogle.—p. 366.

New England Journal of Medicine, Boston 229:667-700 (Oct. 28) 1943

- Civilian Medical Defense and Its Adaptation to Peacetime Civil Life. A. W. Reggio.—p. 667.
*Treatment of Angina Pectoris: Summary of Ten Years' Objective Study. J. E. F. Riseman.—p. 670.
Laryngopycele: Report of Case. O. A. Lothrop.—p. 681.
Pancreatic Insufficiency and Celiac Syndrome (concluded). S. Faiber.—p. 682.

Angina Pectoris.—Riseman reports objective studies of the value of treatment in angina pectoris which have been carried out in a special clinic of the Beth Israel Hospital since 1933. To date sixty-eight different methods of chemical, physical and surgical therapy have been studied by clinical and objective procedures that permit unbiased comparison of effectiveness. It was found that 27 per cent of patients respond strikingly to practically all forms of therapy, 33 per cent respond to a moderate degree and 40 per cent usually fail to respond appreciably. This variation in therapeutic response should be taken into account in any study of the efficacy of treatment of angina pectoris. The clinical evaluation of the efficacy of therapy is extremely difficult and unreliable. Nothing short of complete or almost complete disappearance of attacks can be considered as a favorable response. Such periods may be spontaneous and not related to treatment. Of the sixty-eight methods of therapy evaluated, twenty were found to be of considerable value, twenty-two were of slight value and twenty-six were only of psychologic value. In prescribing medicinal therapy the drugs of choice are glyceryl trinitrate $\frac{1}{400}$ grain (0.16 mg.) every

hour, theobromine and sodium acetate $7\frac{1}{2}$ grains (0.5 Gm.) four times daily, quinidine sulfate 3 to 5 grains (0.2 to 0.32 Gm.) four times daily, atropine sulfate $\frac{1}{150}$ grain (0.4 mg.) four times daily, enteric coated potassium iodide 1 Gm. four times daily, cobra venom given intramuscularly and the sedatives. Few patients require surgery. Total thyroidectomy is of considerable value for selected patients. The paravertebral injection of alcohol gives symptomatic relief to others.

229:701-736 (Nov. 4) 1943

- *Studies on the Destruction of Red Blood Cells: III. Mechanism and Complications of Hemoglobinuria in Patients with Thermal Burns: Spherocytosis and Increased Osmotic Fragility of Red Blood Cells. S. C. Shen and T. H. Ham, with the assistance of Eleanor M. Fleming.—p. 701.
Relation Between the Family Physician and War Industry. K. Pickard.—p. 714.
Pneumococcal Meningitis: Recovery Following Treatment with Sulfadiazine and Specific Antiserum: Report of Case. J. H. Young, C. Schlosberg, C. N. Gettes and S. A. Manconi.—p. 716.
Anemias of Pregnancy. R. A. Dillon.—p. 718.

Destruction of Red Blood Cells: Hemoglobinuria in Burns.—Shen and his co-workers report observations on the blood and urine and on the kidney complications occurring in 14 patients with burns, of whom 10 showed hemoglobinuria. The authors report experimental studies on the effect of heating human red cells and on the effect of injecting heated canine red cells into the dog. Gross hemoglobinuria was observed in 9 patients and minimal hemoglobinuria in 2 among 40 patients with second and third degree thermal burns involving 15 to 65 per cent of the body area. The maximum excretion of hemoglobin occurred during the first twelve to twenty-four hours. The urine samples from patients with gross hemoglobinuria were scanty for one or two days, varied from black to red to light brown and were acid (pH 4.5 to 5.8); they contained hemoglobin in solution, in precipitated form and in casts. The red and brown pigments were identified spectroscopically as oxyhemoglobin mixed with traces of methemoglobin. Eight cases showed hemoglobinemia. Oxyhemoglobin and methemalbumin were detected spectroscopically in the serum of 1 patient. Chronic azotemia occurred in spite of the reestablishment of adequate excretion of urine in 4 of 5 patients with hemoglobinuria who lived five days or longer. In 6 patients with hemoglobinuria examined post mortem the microscopic aspects of the kidneys were consistent with hemoglobinuria. Attempts to establish diuresis of alkaline urine should be made in all severely burned patients. No significant anemia developed during the first forty-eight hours in the patients with hemoglobinuria. If blood is rapidly heated to a temperature of from 51 to 65 C. (123 to 149 F.) there results fragmentation and the formation of spherocytes and microspherocytes, with increase in osmotic fragility and hemolysis of the erythrocytes. In patients with severe or moderately severe burns the red cells exhibited changes in morphology and osmotic fragility similar to those obtained by the injection into dogs of the animals' own erythrocytes heated in vitro to approximately 53 C. (127.4 F.). A significant number of erythrocytes may be destroyed by heat when burns are sustained, probably depending on the temperature attained by the blood, the duration of heating and the volume of blood subjected to these conditions.

New Orleans Medical and Surgical Journal 96:177-238 (Nov.) 1943

- Pneumonia in Army. E. V. Allen and L. W. Baird.—p. 177.
*Sylvatic Plague: Probable Origin in United States, Distribution, Potentialities as Reservoir for Infections in Man. S. A. Trufant.—p. 184.
Common Diseases and Injuries of Spine. E. W. Ryerson.—p. 195.
Indications for Vitamin Therapy. Grace A. Goldsmith.—p. 199.
Unusual Infections in Newborn Caused by Staphylococcus Aureus. Ruth G. Aleman.—p. 207.
Warren Stone. R. G. Allen.—p. 213.

Sylvatic Plague.—Trufant presents a historical review of plague in the United States. According to the importation theory, infected rats carried the plague in ships from the Orient to San Francisco. The enzootic theory suggests that plague infection is enzootic in the Western United States, as it is in Asia and probably the steppes of Russia and in South Africa. Plague in wild rodents exists in at least twelve of the Western

states. Localized epizootics occur usually in the early spring. A vector is substantially indispensable to complete the propagation of plague among wild rodents. For the ground squirrel the vector is the flea *Dipartus montanus*. This flea not only harbored *Pasteurella pestis* but also conveyed it from squirrel to squirrel. These fleas are known to be capable of transmission of the infection after several months of "storage" and starvation. Very low temperature seems to increase the period of infectivity. So far spontaneous infections or reservoirs of plague have been established in over 31 rodents and in rabbits, the former including ground squirrels, marmots, chipmunks, wood rats, kangaroo rats and prairie dogs. Plague once established in a wild rodent population persists, but what the mechanism is has not been demonstrated. The author presents tables which list infected rodents and arthropods and the states in which they were found. Sylvatic plague as transferred to man in the United States was not pneumonic or extremely virulent. However, it is at least theoretically possible that plague might appear in epidemic proportions provided certain conditions as yet inadequately understood are conducive to an increased distribution of the infective agent.

North Carolina Medical Journal, Winston-Salem

4:457-496 (Nov.) 1943

- Arteriosclerosis W. Dock—p. 457
Recent Advances in Treatment of Hypertension. J. R. Williams Jr.—p. 460
Hypertension Due to Unilateral Renal Disease Report of Case R. F. Brooks—p. 463
Combined Isometric and Stereoscopic Technique for Radiographic Examination of Obstetric Pelvis C. T. Javert—p. 465
Typhoid Fever in Children A. McBryde and I. Tedesma Diaz—p. 473
Some Common Diseases of External Ear. A. J. Ellington—p. 478

Western J. Surg., Obst. & Gynecology, Portland, Ore.

51:419-462 (Nov.) 1943

- *Experimental Evaluation of Succinylsulfathiazole and Phthalylsulfathiazole A. C. Kirchhof, C. A. Raetz, A. I. Thompson and N. A. David—p. 419.
Pulmonary Embolism During Continuous Caudal Anesthesia Report of a Maternal Death A. W. Diddle and A. M. Hill—p. 427.
Protein A in Diagnosis of Teratomas Testis T. G. McDougall and A. P. Graham—p. 432
Eclampsia W. S. Morse—p. 436
New Type of Drainage in Gallbladder Field R. C. Chaffin—p. 440
Psychoneurosis G. Prewitt—p. 450

Experimental Evaluation of Succinylsulfathiazole and Phthalylsulfathiazole.—Kirchhof and his associates compared succinylsulfathiazole and phthalylsulfathiazole in studies on dogs. They found that total bacterial counts were not decreased consistently with either drug. No signs of toxicity were noted in any dog during or after medication. Maximum blood sulfathiazole concentrations were 13 mg. free and 16 mg. total per hundred cubic centimeters. Stool consistency was more normal in dogs receiving phthalylsulfathiazole than in those receiving succinylsulfathiazole. The authors emphatically disagree with Poth's suggestion of the prophylactic administration of succinylsulfathiazole to prevent bacillary dysentery in the armed forces who happen to be in insanitary surroundings. The authors think that definite clinical indications should be present before administration of any of the sulfonamides. Their observations show that even if the coliform count is greatly reduced the total count of viable bacteria remains high. Since no guaranty can be made for the nonpathogenicity of this group of bacteria, anticipation of a "sterile bowel" is wishful thinking. Surely no one should relax aseptic technics because of reliance on any of the drugs now available. If the surgeon feels that the hazards of toxic reactions or of establishing sensitivity are of less consequence than a reduced count of *Endamoeba coli*, he is justified in using this type of preoperative management.

Wisconsin Medical Journal, Madison

42:1113-1212 (Nov.) 1943

- Administrative and Professional Problems of Medical Practice in the Hospital. A. M. Schwitalfa—p. 1139.
Professional Accounting H. M. Coon—p. 1148.
Hospitals and Selection of Medical Staffs J. W. Holloway Jr.—p. 1151
Interhospital Relations W. A. Coventry—p. 1154.
Problems Concerning Graduate Education and Employment of Nurses, Interns and Residents. W. A. O'Brien—p. 1157.
Attendant Nursing. Katharine Shephard—p. 1162.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted

Australian J. Exper. Biol. and M. Science, Adelaide 21:133-190 (Sept.) 1943. Partial Index

- d Fructo-Pyranose, A Sugar Unfermentable by Yeast A. Gottschalk—p. 133.
Capillary Fat Embolism in Brains of Sheep, Pigs and Monkeys, with Especial Reference to Demyelination and Other Lesions in the White Matter. E. W. Hurst and Barbara Ternent Cooke—p. 141
Effect of Salicylates (a) On the Estimation of Thiamine by the Thiochrome Method, (b) On the Excretion of Thiamine Joan B. Cleland—p. 153.
Method for Colorimetric Determination of Oxyhemoglobin H. F. Holden—p. 169
New Salmonella Type: Salmonella Adelaide Nancy Atkinson—p. 171
Hypericin and a Nonfluorescent Photosensitive Pigment from St. John's Wort (*Hypericum perforatum*). R. C. Betty and V. M. Frikojus—p. 175.
Pharmacology and Toxicity of Alstonia Alkaloids Patricia Keogh and I. H. Shaw—p. 183.
Some Observations on Excretion of Ketosteroids and Estrogens in Urine of Sheep W. K. Whitten—p. 187.

South African Medical Journal, Cape Town

17:279-294 (Sept. 25) 1943

- *Treatment of Vomiting of Pregnancy by Drugs Which Stimulate Parasympathetic Nervous System A. I. L. Turnbull—p. 279
Theories of Hearing from Morphologic Standpoint J. A. Keen—p. 283.
Spirillum from East African Native. B. de Meillon and R. B. Leech—p. 289.
Expectation of Life and Expectation of Cancer in Union of South Africa C. Phipper—p. 290
Uncertainties About Identity of Adult Schistosomes F. G. Cawston—p. 291.
Further Note on Onyasis in Bechuanaland Protectorate B. T. Squires—p. 292.
Distribution of "Knopspinnkop" (*Latreuteus indistinctus*) R. H. N. Smithers—p. 293.

Vomiting of Pregnancy.—According to Turnbull, carbohydrate starvation is one of the main factors in the causation of the vomiting of pregnancy. Hypertonus of the sympathetic nervous system tends to deplete the liver and muscle glycogen, and this might produce a state of carbohydrate starvation. A drug such as physostigmine sulfate, which stimulates the parasympathetic nervous system, should counteract a state of sympathicotonia. In order to investigate this hypothesis cases of vomiting of pregnancy were treated with physostigmine sulfate in conjunction with a diet rich in carbohydrates. Of 31 patients 29 recovered, 2 failed to respond to treatment and the pregnancy had to be terminated. In 4 cases the treatment was interrupted on several occasions; sometimes two or three days intervened between doses. In the remaining 25 cases the treatment, once begun, was carried out regularly with daily injections or oral administrations of physostigmine. Doses of $\frac{1}{100}$ grain (0.00065 Gm.) should be given two or three times daily. If the patient is unable to take it by mouth it should be given hypodermically. Within fifteen minutes the patient should take a tablespoon of dextrose in a glass of water flavored with lemon or orange juice. The diet should be rich in carbohydrates and poor in fats. The author suggests that sympathicotonia plays a part also in eclampsia, hypertension and albuminuria and recommends further investigations of the influence of the autonomic nervous system on the toxemias of pregnancy.

Transactions Royal Soc. Trop. Med. and Hyg., London 37:67-168 (Sept.) 1943

- Leptospirosis in Southern Nigeria: Case J. I. Lesh and D. A. Cannon—p. 89
Fever of Dengue Group Occurring in West Africa G. M. Findlay and R. W. Brookfield—p. 95
Differential Diagnosis of Infantile Beriberi Lydia Feby—p. 111
Some Observations on Study and Control of Yellow Fever in Africa with Particular Reference to Anglo Egyptian Sudan R. Kirk—p. 125
Hemoglobinuria Following Administration of Plasmoquine W. N. Mann, with Note by S. Smith—p. 151.
Sulfapyridine in Typhoid Fever. M. Rachmilewitz and K. Braun—p. 157.
*Phenothiazine in Treatment of Human Intestinal Helminthic Infestations. M. Elliott—p. 163

Phenothiazine in Human Helminthic Infestation.—Observations among the natives of West Africa convinced Elliott that phenothiazine may be a potent destroyer of hookworms. He was also impressed by its action against *Strongylo-*

loides stercoralis, parasites which up to this time have been very difficult to deal with in some patients. Kuitunen-Ekbaum in Canada studied its action against threadworms and found that it exercised a powerful destructive action. The author has given the drug to over 70 adult natives and has been impressed by its lack of unpleasant sequelae as compared with 50 control patients to whom santonin, oil of chenopodium or carbon tetrachloride had been given. He thinks that the American standard dose of 1 Gm. per 10 pounds (4.5 Kg.) of body weight is a safe level, because he experienced no intolerance with even twice this dose. To adults he gave over a period of four or five days a total dosage that varied between 20 and 30 Gm. Two 1 Gm. tablets are usually given three times a day. The tablets should be crushed. Of 36 patients with *Ancylostoma duodenale* 26 were cured, of 8 with *Strongyloides stercoralis* 5, of 15 with *Ascaris lumbricoides* 9, of 8 with *Taenia saginata* 5, of 8 with *Trichuris trichiura* 5 and of 9 with *Endamoeba histolytica* 6.

Revista Clínica Española, Madrid

9:365-442 (June 30) 1943

*Erythroblastosis Neonatorum. M. María de Mendizabal, E. de Amilibia and J. S. Harguindey.—p. 366.
Cervicobrachial Syndrome Due to Cervical Rib. J. P. Cornago and J. A. Tercedor Avilés.—p. 401.

Erythroblastosis in Newborn Infants.—Mendizábal and his collaborators observed 2 mothers of 10 newborn infants with erythroblastosis fetalis. One mother had four pregnancies: (1) Her first infant was normal and is 6 years of age; (2) there was a set of twins with acute pallor who died within six days; (3) an infant with jaundice and subcutaneous hemorrhages died within three days, and (4) an infant with acute hydrops died a few minutes after birth. The blood of the mother, her husband, the child and the fetus are of the same blood group. However, the blood of the mother agglutinated that of the husband, of the child and of the fetus. The second mother, 34 years old, had three abortions and four pregnancies with deliveries of living infants. The first two infants died within three days of acute jaundice; the third infant died within three hours after birth of acute anemia; the set of twins from the fourth pregnancy died of acute jaundice within four days. The blood of the mother agglutinated the blood of the husband and of the last fetuses. A large number of erythroblasts were observed in the blood of the placenta of 1 of the fetuses and in the blood of the liver of another. All fetuses were male. Neither couple had syphilis. The blood of any of the 2 women did not agglutinate that of the other. It did not agglutinate with control A₁MN blood serum. The blood serum of both women caused agglutination in blood of the largest number of persons of the O group blood. The results suggest the presence of a typical anti Rh agglutinins in the blood of both women and the pathogenic role of isoimmunization in erythroblastosis fetalis. One of the women had progesterone in large doses during pregnancy of the twins who were born with jaundice.

Revista Médica de Chile, Santiago

71:829-944 (Sept.) 1943. Partial Index

Hemolytic and Nonhemolytic Familial Jaundice. H. Ducci, R. Etcheverry, A. Nijamkin and J. Zañartu.—p. 837.
Mammary Carcinoma. A. Rahausen and C. Sayago.—p. 853.

*Prothrombinemia and Vitamin K in 106 Patients with Chronic Pulmonary Tuberculosis. J. Motlis and J. Guash.—p. 871.

Prothrombin in Pulmonary Tuberculosis.—The prothrombin time was determined according to Quick's technic in 106 cases of chronic pulmonary tuberculosis observed by Motlis and Guash. In 30 per cent of the cases there was a significant decrease of the prothrombin level in the blood. No relationship could be established between the presence of low prothrombin levels and the occurrence of hemoptyses, the stage of development of the disease, the presence of tuberculous intestinal lesions or the microscopic appearance of the liver. In the cases presenting hemoptyses, with or without low prothrombin levels, the intravenous administration of vitamin K had no effect on the severity, frequency or continuation of the hemoptyses. Severe and extensive pulmonary lesions were, as a rule, associated with the most noticeable decrease in prothrombin level, and Motlis and Guash point out that in this sense the test may have some prognostic value.

Deutsche Zeitschrift für Chirurgie, Berlin

255:667-816 (July 20) 1942

*Pathologic Anatomic Observations on Surgically Removed Sympathetic Cervical Ganglions in Bronchial Asthma. E. Hagen.—p. 667.
Clinical Studies on Postoperative Pulmonary Suppurations. G. Guerrieri d'Antona.—p. 700.
Postoperative Pulmonary Complications. A. Fehr, C. Molo and O. Walther.—p. 732.
Giant Echinococcus Cyst of Kidney with Complete Disappearance of Renal Parenchyma. V. Lazarević.—p. 747.
Myiasis Linguae—Two Maggots of *Wohlfahrtia Magnifica* in Papillae Circumvallatae of a Previously Healthy Tongue. N. Gunttschiff.—p. 751.
Closure of Solitary Pulmonary Cyst by Muscular Plastics. O. Diebold.—p. 756.
*Treatment of Niche-Forming Gastric Ulcer and Relations to Carcinoma. M. Siebner.—p. 764.
Bone Transplantation Particularly with Os Purum and Os Novum. W. Stark.—p. 776.

Pathologic Anatomy of Sympathetic Cervical Ganglions Removed for Bronchial Asthma.—Hagen reports observations on surgically removed cervical ganglions of 7 patients with bronchial asthma. The formaldehyde fixed frozen sections were prepared according to the silver method of Bielschowsky-Gros. The author stresses the importance of this silver stain, pointing out that a large number of pathologic processes in ganglion cells can be visualized only by this method. The report is illustrated with excellent drawings. Detailed descriptions are given of the microscopic changes in the ganglion cells, the nerve fibers and the interstitial tissues. The majority of the ganglion cells show pathologic changes. They frequently exhibit a disharmony of processes with hypertrophic glomerulus-like ball formation. Vacuolation and granular degeneration are often seen in the body of the ganglion and in the processes. The appearance of spherical terminal formations in the processes is a sign of pathologic irritation. Accumulation of pigment as well as pathologic nuclear changes can be observed in the ganglion cells. The increased appearance of multinuclear ganglion cells and the pathologic changes observable in them represent another degenerative process in bronchial asthma. The hyperplasia of finest nerve fibers near diseased ganglion cells probably is a manifestation of pathologic growth and regeneration. Although the majority of ganglion cells show pathologic changes, the nerve fibers and the connecting branches emerging from the ganglion show no degenerative changes in the axis cylinders. Acute inflammatory processes are seen repeatedly in the interstitial cells. The microscopic changes indicate not only that bronchial asthma is a "functional" disorder but that serious organic changes exist in the sympathetic nervous system. It is possible that the changes in the sympathetic cervical ganglions are the cause of the secondary symptoms of asthma. The presence of multinuclear degenerated ganglion cells in the lower cervical ganglion suggests that asthma is possibly preceded by disturbances in the development of the sympathetic system which are decisive in the constitution of the asthmatic patient. The clinical symptoms of such patients with their allergic-hyperergic reactivity might result from a disturbance in the neuroendocrine system, and the treatment of asthma therefore should be directed toward this system.

Treatment of Niche-Forming Gastric Ulcer.—Siebner states that whereas the niche-forming ulcers require surgical treatment only in the case of rupture or in the presence of signs of threatening perforation, the chronic callous gastric ulcers with giant niches always require operation because medical treatment is often ineffective, because of the refractoriness and severity of the symptoms and because of repeated hemorrhages and increasing cachexia. Another reason for surgical treatment is the danger of malignant degeneration of the ulcer. This serious complication is best demonstrated by repeated roentgen examination. If the niche does not become smaller after from two to four weeks of ulcer treatment and if there are changes suggesting a malignant process in the mucosa adjacent to the ulcer, resection is to be carried out. Histories of several patients with giant niches suggest that diagnostic mistakes cannot always be avoided in spite of careful investigation of the early history, of the clinical and roentgenologic studies and even of careful macroscopic inspection of the resected specimen. Microscopic examination is necessary for an exact diagnosis.

Book Notices

Nervousness, Indigestion, and Pain. By Walter C. Alvarez, M.D., Professor of Medicine, University of Minnesota (Mayo Foundation), Rochester, Minnesota. Cloth. Price, \$5. Pp. 488. New York & London: Paul B. Hoeber, Inc., 1943.

"This is a different sort of book—one which deals more with sick unhappy persons than with their diseases, more with symptoms and their meaning than with disease entities, more with the handling of patients than with the giving of medicines, and more with the puzzling, poorly understood and poorly described abdominal discomforts and indigestions than with the well known organic diseases such as ulcer, cholecystitis and cancer."

This opening statement from the preface describes an interesting and valuable distillation from the experience of an intelligent, humane and seasoned practitioner who has taken the time and made the effort to know his patients as human beings and thereby has found an important relationship between the emotional life and illness. Not only is the material different from the usual medical book but the chatty, informal manner in which it is written is a pleasant relief from the orthodox medical treatise. Even the chapter titles are different: "Help in Sizing Up the Patient," "Telling the Truth to Patients," "Handling the Nervous Patients" are examples. One of the most valuable chapters presents many helpful points in history taking, showing its importance in making a diagnosis. Equally emphasized throughout the book are errors which arise from too great a dependence on laboratory reports to the exclusion of good clinical judgment.

Although written from the general medical point of view and of interest to all physicians, the book deals chiefly with the three main complaints that gastroenterologists commonly find associated together—nervousness, indigestion and pain. Thus it will make its appeal particularly to specialists in this field. For them Dr. Alvarez has some very good advice: "Every gastroenterologist who hopes to be worthy of the name and would like to keep from making one serious blunder after another should be learning all he can about the psychiatry of apparently sane. Like me, he may not have wanted to get to this field of medicine, but he cannot stay out of it and be a safe internist." If the experience of civil practice does not amply confirm this statement the medical experience of the present war surely does. Witness the emphasis on gastrointestinal disorders and their relation to the emotions and one must realize that, just as the first world war gave great impetus to the development of scientific psychiatry, so the present war is seeing its final integration into general medicine, in other words, psychosomatic medicine. Dr. Alvarez has furnished his fellow gastroenterologists with a fine introduction to this highly important subject. It must be emphasized, however, that it should be looked on only as an introduction because there is nothing to suggest that psychopathology and differential diagnosis based on personality structure must be understood in relation to disorders of emotional origin, just as tissue pathology serves as the background for an understanding of structural disease. Psychopathology bears the same relation to "nervousness" that histopathology does to organic disease. Indeed, if one was to find any fault with this interesting book it would be that Dr. Alvarez lumps all nervousness together and when he gets into difficulties he calls on all ill defined concept, "constitutional inadequacy," to suggest that further help is impossible. The concept of "constitutional inadequacy" is confused with psychoneurosis, and this reviewer questions whether such patients must resign themselves to their fate.

Like a wise and experienced gross pathologist who makes shrewd guesses from the gross appearance of diseased organs, so may the experienced clinician make shrewd guesses from gross distortions of the personality. But he is in a much happier position if he knows the underlying structure of the personality. Such knowledge is now available, and gradually our medical schools are teaching it.

More important, however, than this knowledge is Dr. Alvarez's sympathy and broad human understanding, his liking for people

and his remarkable gift for understanding their troubles. If we would have to choose between these qualities and a knowledge of scientific psychopathology in trying to help our patients, by all means let us have the former. As much of these qualities as can be put in a book are in this one. It can be read with profit and it will certainly be read with pleasure.

First-Aid Training: A Study and Practice Book. By Morris Fishbein, M.D., Editor, Hygeia, the Health Magazine, Chicago, and Leslie W. Irwin, Ph.D., Director of Health and Physical Education, the Laboratory Schools, University of Chicago. Paper. Price, 80 cents. Pp. 216, with 57 illustrations. Chicago: Lyons & Carnahan, 1943.

This is a workbook intended for use in secondary schools. There are fourteen units, plus unit and review tests and lists of first aid supplies. There is a pronunciation word list. The units deal, in the order named, with the importance of knowing first aid; the body machine; shock, first aid for wounds; bleeding; asphyxia; internal poisoning; bandaging; injuries from heat and cold; puncture, gun and powder wounds; animal and insect and poisonous snake wounds; fractures, dislocations and sprains; everyday problems in first aid; first aid for the unconscious and emergency transportation of the injured. Each unit includes a factual presentation, well illustrated, a list of assigned activities and a practical problem, with a review section of "things to remember." The format is ingenious. It is bound in paper with pages perforated so that they may be torn out for handing in to be graded. The pages are also punched to fit a standard two ring binder so that they may be assembled in a binder. Or the binding may be detached from the whole book and all of it may be kept in a ring binder. This should be a very useful instrument wherever first aid is being taught on a practical basis.

Addendum to the Chemistry of the Amino Acids and Proteins Inclusive of Some of the Advances Since 1937. Edited by Carl L. A. Schmidt, M.S., Ph.D., Professor of Biochemistry and Dean of the College of Pharmacy, University of California, Berkeley. Cloth. Price, \$5. Pp. 1035-1290, with illustrations. Springfield, Illinois, & Baltimore: Charles C Thomas, 1943.

In a field which is developing as rapidly as that of protein chemistry, a period of five years may bring with it many significant advances. Instead of completely revising the book "The Chemistry of the Amino Acids and Proteins," published in 1938, the editor and publisher of that work have seen fit to bring the subject matter up to date by the publication of this addendum. The chapter headings in this volume are the same as the chapter headings in the original work, and the text has been written in practically all cases by the original authors. Its pagination continues that of the first edition, and this addendum also appears as a supplement in the second edition of "The Chemistry of the Amino Acids and Proteins." Some chapters have been extended much more than others, as required by the amount of new material available. While it is questionable whether such a method of revision is completely satisfactory, this addendum is sure to be welcomed by all students of the subject, and especially by those who possess the original volume. For new readers interested in obtaining a comprehensive view of the whole field of modern protein chemistry, this book, when used in conjunction with the original work, still remains the best available source of information in this highly important field.

The Ear, Nose and Throat in the Services. By R. Scott Stevenson, M.D., F.R.C.S., Major R. A. M. C., Otolologist to a Military Hospital, Oxford War Manuals. General Editor: The Rt. Hon. Lord Horder, G.C.V.O. Cloth. Price, \$1.50; 3s. Pp. 116, with 16 illustrations. New York & London: Oxford University Press, 1943.

The author intended this manual as an aid for the average medical officer in the various military services as well as for those in civil life who may be called on to care for war casualties on the home front. Although the well trained otologist might read this work with no more than casual interest, it would if carefully studied be of great use for the others mentioned. The author writes well; he tries to discuss only what is essential, and he has adorned his little manual with drawings made presumably by himself. The size, furthermore, recommends it; fitting the coat pocket easily, it can be read in moments snatched from duty.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

PHYSICAL STRAIN AND CORONARY OCCLUSION

To the Editor:—What is the best opinion on the relation of strain in causing a coronary occlusion in a man aged 54 without previous history of heart disease? What do the records show in decisions made in compensation courts concerning the relation of coronary occlusion to stress? This coronary attack came on right after the man had lifted numerous shovels of sawdust weighing 35 pounds.

Bennie Mecklin, M.D., Watertown, N. Y.

ANSWER.—The balance of opinion concerning the direct relationship of physical strain to coronary thrombosis with myocardial infarction is that in the vast majority of cases there is no such relationship. This will probably amount to at least 95 per cent of the cases, but there are infrequent, clearcut instances in which excessive physical strain is accompanied or immediately followed by typical coronary occlusion in persons who may or may not have had angina pectoris previously. It is quite likely that an actual hemorrhagic lesion or some such development is precipitated in the coronary artery wall by the strain and that this in turn leads to the coronary occlusion.

Prof. Hubert Smith of the Harvard Law School has recently added the following statement to these comments:

The relation of coronary thrombosis to stress or unusual exertion is recognized by workmen's compensation commissions and courts to be a problem of scientific proof. Under compensation law preexisting heart disease does not bar compensation if an unusual exertion, not characteristic of the ordinary performance of that job, leads to cardiac injury or death. Such unusual exertions are considered to be "accidental injuries sustained in the course and scope of employment." Causal connection is not at present being proved with any great degree of scientific acumen. The compensation laws of a few states authorize the commissioners to order postmortem examinations, but such clauses are but rarely invoked, and the proof now rests principally on the "post hoc, ergo propter hoc" basis, causal inference being drawn from speedy effects following over-exertion.

LOSS OF HAIR AND SULFONAMIDE THERAPY

To the Editor:—About two months ago I treated two women for peritonsillar abscesses with sulfathiazole. The total dosage in each particular case did not exceed 20 grains (1.3 Gm.) over a period of seven to eight days. Now these women have been complaining that they have been losing their hair, the onset of loss beginning about a week after the stopping of the sulfonamide. I cannot find anything wrong with the scalp. Has the loss of hair ever been reported as a complication of the use of sulfathiazole? Have you any suggestions as to the cause of this condition?

James A. Rooney, M.D., Newport News, Va.

ANSWER.—The loss of hair has not been reported as a complication of sulfathiazole. It is exceedingly doubtful that two women with the same disease, and given only 20 grains of sulfathiazole during a period of a week, should have a loss of hair because of the sulfonamide therapy. No mention is made about other complications being due to the sulfonamide, so the assumption is that none were present. It is not unlikely that the loss of hair might be due to the infection. It is well known that severe infections, particularly typhoid, may be associated with extensive but temporary loss of hair.

PREGNANCY AND SYPHILIS

To the Editor:—A woman received adequate antisyphilitic treatment, following which a negative Kahn reaction was reported. While carrying one child she continued receiving arsenicals and heavy metals. The child was born with a negative Kahn reaction. The mother is again pregnant and still has a negative blood reaction for syphilis. Should she receive more treatment while pregnant?

M.D., Michigan.

ANSWER.—Nothing is said as to how long the patient has had her syphilis. While she has a negative Kahn reaction, this does not mean that she is biologically cured. She may still have organisms in her system and on that account the Surgeon General's Cooperative Clinical Group has advised that all pregnant women with syphilis receive treatment throughout their pregnancy, emphasis being laid on arsenical therapy at the beginning, a short course of bismuth and arsenical therapy (mapharsen) at the end.

VALUE OF WIDAL TEST IN DIAGNOSIS OF TYPHOID

To the Editor:—During the past year there were several cases of typhoid in the community and the question of the diagnostic significance of the Widal test arose. In July 3 persons became ill almost simultaneously. Patients A and B were proved by blood and stool cultures to have typhoid. Patient C was ill for three weeks with temperatures ranging from 100 to 102 F. The only complaints were of general malaise and severe headache and backache. The pulse rate paralleled the degree of fever without significant bradycardia. There was a transitory macular rash during the first week of the disease, and the spleen became palpable during the second week. Otherwise physical examination was not helpful. During the first week of the disease the white blood cell count was 4,950 with 66 per cent polymorphonuclears, 31 per cent lymphocytes, 2 per cent monocytes and 1 per cent eosinophils. The blood count rose to 9,250 with 62 per cent lymphocytes during the second week and to 10,200 with 66 per cent lymphocytes during the third week of the disease. On the ninth day of the disease a Widal test was negative and blood culture was negative. On the fifteenth day the Widal became positive in a dilution of 1:160 and blood culture was again negative. On the thirtieth day the titer of the Widal had fallen to 1:40. Stools and urine were repeatedly negative throughout the course of the disease. Since the 3 cases developed in the same locality, case C was assumed to be typhoid despite the lack of bacteriologic confirmation. However, the epidemiologist from the state department of health stated that the Widal test in case C was of absolutely no significance unless a positive culture from the blood, urine or stools was obtained. Patient D, a laboratory technician who had been in contact with all 3 of the patients, had been given prophylactic inoculations for typhoid in the summer of 1942. During the first part of October 1943 she became ill with general symptoms of malaise, headache and bowel disturbance. Her temperature never rose above 101 F. although a low grade fever has now persisted for three weeks. Physical examination has revealed none of the confirmatory signs of typhoid, nor any others of significance other than a mild pharyngitis early in the disease. The blood count on the seventh day of the disease showed 16,000 white blood cells and 72 per cent polymorphonuclears. On the eighth day a Widal test was positive in a dilution of 1:640. This was confirmed by a positive Widal in the same dilution the following week. Agglutinations for *Brucella abortus* and paratyphoid were negative. Blood, stool and urine cultures have all been repeatedly negative. I would appreciate an opinion as to the significance of the positive Widal reactions in cases C and D.

M.D., Michigan.

ANSWER.—While it is true that in general a positive diagnosis of typhoid cannot be proved without cultivation of the organisms from the blood, a negative blood culture or even more than one negative does not exclude the diagnosis. A single positive preceded or followed by one or more negative cultures is not a rare occurrence, illustrating the limitation of the method. Positive cultures from urine or stools, while of course usually highly significant, might indicate only a carrier condition, while a negative culture may mean that the time in the course of the disease was not opportune or that an unsuitable culture medium was selected. The significance of the Widal reaction in the cases referred to may well be the subject of difference of opinion, but the following would receive wide acceptance:

In case C, mention is not made of previous typhoid vaccination, which might obscure the situation; therefore the appearance of typhoid agglutinins might well be accepted as strongly suggestive of a diagnosis of typhoid.

In case D the prior typhoid vaccination might account for the presence of agglutinins; hardly likely, however, in dilutions as high as indicated, unless a nonspecific elevation had occurred. Even in this case unless another diagnosis could be substantiated the evidence would be considered as pointing strongly to typhoid, especially as typhoid is reported often to run an atypical course in previously vaccinated persons.

It might have been possible to derive more information had data been available on O and H agglutinins, especially in case D.

In the absence of data establishing another diagnosis, that of typhoid is highly probable in case C and a strong possibility in case D.

CONVALESCENT SERUM AND Rh FACTOR—Rh FACTOR IN HORSE AND RABBIT

To the Editor:—Is it possible to transmit the Rh factor in convalescent human serum? Has the Rh factor been found in the horse or rabbit?

Philip Leavitt, M.D., Brooklyn.

ANSWER.—The term Rh factor is properly applied only to the antigen or agglutinating Rh in the erythrocytes. Accordingly, it would not be possible to transmit the Rh factor in convalescent human serum. Perhaps the inquirer when mentioning the Rh factor intends to refer to the isoantibody anti Rh, present in the serum of some persons sensitized to the factor. Since only 1 out of 7 persons are Rh negative and of these only approximately 1 out of 50 are easily sensitized, it is evident that only 1 among about 350 persons would be readily sensitized against the Rh factor. When, in addition, one considers that the only methods of sensitization known are by the repeated transfusions of Rh positive blood or by pregnancy with an Rh positive fetus, it is evident that the likelihood that donors of blood for the preparation of convalescent serum will have anti Rh isoanti-

bodies in their serum is extremely remote indeed. When one also bears in mind that usually pooled convalescent serum is used and the doses of such serum are small, it becomes obvious that the possible danger from this source is virtually nonexistent.

Thus far, Rh agglutinogens and natural anti Rh antibodies have not been demonstrated in the horse or rabbit. Immune Rh antibodies have been produced in the rabbit by the injection of rhesus monkey blood and human Rh positive blood, but similar experiments have not yet been tried in the horse.

POISONOUS FISH OF SOUTH PACIFIC

To the Editor:—As there are many varieties of fish in the South Pacific area, some of which are poisonous, it would be of assistance to us to know which of the fish are poisonous and when they are poisonous. Some of the local named fish are Tazar, Caraque, Ferroquet, and sardines which are considered not fit to eat. Rouget, Bossy and Bec de Caune are considered good to eat. It would be appreciated if we could have the names, especially common names, of the fish to be avoided.

Major, M. C., A. U. S.

ANSWER.—The great majority of tropical fishes are edible, although they vary greatly in palatability. They should be consumed when fresh, as they deteriorate rapidly. Occasionally even edible fishes are unwholesome because of feeding on certain kinds of food. The flesh of a few species is definitely poisonous, and some others are suspected of poisonous qualities. The safest guide is provided by the eating habits of the natives. Vernacular names are not of much value, as they change with the different localities. When known, the Hawaiian (H) and Samoan (S) names of the principal suspected groups are given in the following list:

Globefishes and Puffers.—Makimaki (H); Sue (S). Bodies balloon-like, capable of distention with air when taken from water; skin either smooth, like sandpaper or covered with erectile spines; teeth fused like a parrot's beak; flesh poisonous.

Filefishes.—Oili (H). Bodies laterally compressed; skin leathery or like sandpaper; a single, long, erectile spine on back; some species poisonous.

Triggerfishes.—Humuhumu (H); Sumu (S). Bodies diamond shaped viewed from the side; three erectile spines on back (graduated in length); usually a strong spine at lowest point belly; often highly colored; occasionally eaten but considered poisonous.

ed Snapper.—Mumea (S). Shaped like our bass, but with pointed nose; mouth with prominent canine teeth; dark red; grows to 2 feet in length; reported extremely dangerous.

Scorpions.—Omakaha (H); Nofu, Sausalele (S). Resemble our sculpins, often with winglike pectoral fins; head bony with numerous blunt spines; row of sharp spines on back, which are provided with venom and are capable of inflicting a serious sting. Flesh is wholesome after spines and venom sacs are removed.

Poison Toadfish.—Nofu (S). Resembles a lump of lava or coral; slow swimming; hides among rocks on bottom; venom on spines deadly but flesh wholesome if spines and poison sacs are removed. Extremely dangerous to bathers.

Reference:

"Poisonous and Harmful Fishes," Bulletin 159, Council of Scientific and Industrial Research, Commonwealth of Australia. Pamphlet, 28 pages, pictures (some colored). Melbourne, 1943.

GAS IN VAGINA AND TRICHOMONAS VAGINALIS

To the Editor:—I should like to know the cause of the formation of gas in the vagina and its treatment. Lieutenant Commander (MC), U.S.N.R.

ANSWER.—Practically the only free gas that can be found in the vagina is that which escapes into the vagina from the rectum through a rectovaginal fistula and that which is expelled into the vagina from the uterus in the rare cases of physometra. Aside from these instances, gas in the vagina nearly always exists in the form of foam. The latter condition is associated with *Trichomonas vaginalis* vaginitis. There is an excellent review of this subject in THE JOURNAL, Oct. 23, 1943, page 481.

There are a large number of ways of treating *Trichomonas vaginalis* vaginitis, and almost any type of therapy will quickly relieve the patient of her annoying discharge and irritation. However, recurrences are common regardless of the type of treatment. One of the simplest forms of treatment is as follows: The vulva, vagina and anal region are cleaned with tincture of green soap, and washed with tap water. The vagina and vulva are then thoroughly dried. Powder is blown into the vagina and on the cervix by means of a special blower, and some of the powder is also deposited on the vulva. Among the

satisfactory powders are aldarson, floroquin and picric acid. This treatment is carried out every second day for three or four times. If the cervix is eroded it should be cauterized. Vinegar or lactic acid douches are helpful.

CAFÉ AU LAIT SPOTS AND ALBRIGHT SYNDROME

To the Editor:—Will you please inform me as to the significance of "café au lait spots" and their relation to Albright's disease, a disease entity I am unable to find in the few textbooks that are available.

Lieutenant (MC), U.S.N.R.

ANSWER.—"Café au lait spots" are simply areas of brownish pigmentation within the skin. They may be single, discrete or disseminated, small or large, raised or flat. They are thought to be a result of some abnormal development of peripheral nerves and are frequently spoken of as cutaneous flat neurofibromas. Albright described a peculiar group of symptoms or findings which have become known as the "Albright syndrome." This is characterized by osteitis fibrosa, disseminating areas of pigmentation and, at least in the female, precocious sexual development. It was Albright's opinion that the condition represents an abnormal development within the central nervous system and is not primarily due to endocrine dysfunction. Braid has reported cases and expressed the opinion that this entire syndrome might be the result of icterus gravis neonatorum. His arguments do not seem to be borne out by the rather large series of cases studied by Albright.

References:

- Albright, Fuller; Butler, Allan M.; Hampton, Aubrey V., and Smith, Patricia: Syndrome Characterized by Osteitis Fibrosa Disseminata, Areas of Pigmentation and Endocrine Dysfunction, with Precocious Puberty in Females, *New England J. Med.* 216: 727 (April 29) 1937.
Albright, Fuller; Scoville, Beecher, and Sulkowitch, H. W.: Syndrome Characterized by Osteitis Fibrosa Disseminata, Areas of Pigmentation and a Gonadal Dysfunction, *Endocrinology* 22: 411 (April) 1938.
Braid, Frances: Osseous Dystrophy Following Icterus Gravis Neonatorum: Generalized Osteitis Fibrosa with Areas of Pigmentation of the Skin and Precocious Puberty in the Female, *Arch. Dis. Childhood* 14: 181 (Sept.) 1939.

TIME OF INSULIN ADMINISTRATION IN RELATION TO MEALS

To the Editor:—Will you please tell me at what time, with relation to meals, insulin should be taken in moderate or mild cases of diabetes? Why is it advised many times to take it fifteen or twenty minutes before meals when the food would not get into the system until at least one or two hours after meals?

Henry J. Winkler, M.D., L'Anse, Mich.

ANSWER.—In diabetic patients the absorption of both regular and crystalline insulin from the site of injection is most rapid during the first hour after injection, and thereafter the rate of absorption is much slower but continues for at least five hours. Similarly the sugar in the blood in the diabetic rises rapidly during the first thirty to sixty minutes after food and may not fall during the next few hours unless the action of insulin brings about a decline in the blood sugar. To secure the maximum benefit from insulin, its injection one-half hour before a meal makes active a larger part of the injected dose during the period of rapid rise in blood sugar than would be true if the insulin injection took place at a later time.

With protamine zinc insulin the time of injection is of less importance. Protamine zinc insulin acts so slowly that a difference of one-half hour counts little. On the other hand, if crystalline insulin and protamine zinc insulin are given separately or together before the meal, it is most desirable that food be taken within about fifteen minutes of the injection. The reason for this is that a patient under the influence of protamine zinc insulin tends to have the blood sugar well down to normal in the morning before breakfast, and a few additional units of a quick acting insulin at that time might depress it still more and a reaction might result.

Rules for giving insulin are not absolute. One must expect that changes will take place both in the absorption of food and in the absorption of insulin.

EDEMA OF ARM AFTER TYPHOID VACCINATION

To the Editor:—Recently in a fairly large series of injections of a booster dose of typhoid vaccine (U. S. Army 0.5 cc.) given in the usual manner I observed one soldier who developed an edema of the corresponding upper extremity. This reaction came on within one hour and extended from the finger tips up to the site of injection (deltoid region). The edema was fairly firm, pitted slightly, was not tender, was limited to the dorsal aspect and did not show any color change. There was no complaint of pain. The edema was of moderate degree. No therapy was advised. When observed the next day, about twenty hours after the injection, the extremity looked normal and there were no traces of edema anywhere. The injection site was normal in appearance. There was no general reaction.

Solomon Grossman, Captain, M. C., A. U. S.

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RED CELL REINFUSION AND THE FREQUENCY OF PLASMA DONATIONS

PRELIMINARY REPORT OF MULTIPLE DONATIONS IN EIGHT WEEKS BY EACH OF SIX DONORS

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The average donation of 500 cc. of blood entails the loss to the donor of approximately 75 Gm. of hemoglobin and 17.5 Gm. of plasma proteins, or a total of approximately 92.5 Gm. of proteins (taking hemoglobin for practical purposes as 100 per cent protein). The red cells as a rule are discarded, so that 80 per cent of the protein donated may be said to be wasted. This waste in the 5 million units of plasma required by the armed forces this year represents a loss of 375,000 Kg. of human hemoglobin and 188 Kg. of iron!

If, however, the red cells are reinfused into the donor, then he is relieved of 80 per cent of this protein drain and from purely quantitative considerations should be able, theoretically, to donate plasma five times more frequently than is the practice at present, which is at most one donation every eight weeks. The present work is an attempt to determine within what range this mathematical consideration holds true.

PRESENT WORK

A group of 6 volunteer donors, each on a federal government prescribed diet adequate both in calories and in nitrogen intake, were subjected to frequent blood donations. In the first group of 3 donors, donor 1 gave three donations and donors 2 and 3 gave four each on alternate days, receiving back the red cells suspended in 5 per cent dextrose solution the day subsequent to the bleeding. The total amount bled was in each case approximately 34 per cent of the blood volume calculated from the body weight

(using 8 per cent as the factor for males and 9 per cent for females). The hematocrit, hemoglobin value and the plasma protein concentration determined either by the falling drop method¹ or the chemical method of tyrosine equivalent² were followed in each subject before and after each donation. The reticulocyte count and the serum bilirubin level were determined in an attempt to find out whether red cell destruction had taken place as a result of the artificial extracorporeal condition to which so high a percentage of red cells had been exposed. The results are shown in tables 2 to 4. It will be seen that the final hematocrit and hemoglobin values and plasma protein levels were practically the same after the donations as the initial values, although after each bleeding and before the reinfusion of red cells they registered a slight drop. The bilirubin level showed a very slight rise into the upper limit of normal after each reinfusion, perhaps as a result of the reinjection of a small amount of hemoglobin set free by hemolysis, but promptly fell to lower values. The reticulocyte count was always within normal limits.

In the second group of 3 donors, each gave a full sized donation weekly, 1 for nine weeks and 2 for twelve weeks. In addition to the tests performed in the first group, the hemoglobin, the red, white and differential counts, the albumin and globulin partition and fragility tests were also determined. It will be seen from tables 5 to 7 that there was no perceptible change in the blood picture.

All 6 felt subjectively well throughout the donating period, except that donor 5 had a slight pyrogenic reaction after the 7th reinfusion. No intercurrent infection developed in any one of these 6 subjects. Their weights have either remained the same or risen. The initial and final values are summarized in table 1. It thus appears that full sized blood donations may be made on alternate days for four consecutive times or every consecutive week for from nine to twelve weeks without any change in the blood picture as determined by these tests or in the well-being of the donor.

The electrophoretic distribution of the plasma proteins of C. P. is given in table 8. It is seen that no significant alteration of the pattern is discernible even after twelve weekly donations.

COMMENT

As far as can be determined by a review of the literature, the prescription of the eight week interval between blood donations has been made by the work on hemoglobin and red cell regeneration. This period seemed logical when whole blood was used. However,

From the Laboratory of Experimental Surgery and the Department of Surgery, New York University College of Medicine and the U. S. P. H. S., Sheepshead Bay, N. Y., under a grant from Williams-Waterman Fund of Research Corporation.

The electrophoretic studies reported here were done in the laboratory of Dr. J. W. Williams, Department of Chemistry, University of Wisconsin, with the cooperation of Drs. Mary L. Peterman, Margaret Bender and Miss Martha Blake Goodloe.

1. Barbour, H. G., and Hamilton, W. F.: The Falling Drop Method for Determining Specific Gravity. *J. Biol. Chem.* 69: 625, 1926.

2. Greenberg, D. M.: The Colorimetric Determination of the Serum Proteins. *J. Biol. Chem.* 82: 545, 1929.

as a result of a shift in therapeutic emphasis to the use of plasma a somewhat illogical situation now exists in that the rate of regeneration of a waste product is made to be the pacemaker of another product, plasma proteins, which for all that is known may have an entirely different replacement rate.

There may be said to be two schools of opinion on how frequently a person may donate whole blood.

basis of a study of 4,000 transfusions given by 500 donors, stated that if 400 cc. or less is donated male donors may be used four or five times at intervals of one to five days without ill results. They reported 2 donors with pronounced regenerative powers for hemoglobin, 1 donating 2,000 cc. in eighteen days and recovering completely in ten days. Both of the latter teams of workers, however, warned that the

TABLE 1.—Master Table Showing Various Values of Six Patients Giving Frequent Multiple Donations

Initials, Age, Sex	Weight, Kg.	Calcu- lated Blood Volume, Liters	Trans- fusion, Days	Amount Bled, Liters	Per Cent Bled	Hemato- crit, per Cent	Hemo- globin, Gm.	Red Blood Cells, Millions	White Blood Cells, Thous- ands	Differential Count, Poly- morpho- nuclears/ Lym- phocytes	Reti- culo- cytes	Total Plasma Proteins, Gm. %	Albu- min/ Glob- ulin	Van den Bergh Units, High	Fragility, Final	Approx- imate Amount Protein Donated, Gm.
E. B., 22, ♀	...	4.69	3/9	1.53	33	...	...	...	...	...	...	...	...	0.45	.....	65
Initial.....	52.2	...	...	...	...	31	...	...	...	...	0.9	6.5	...	...	...	...
Final.....	52.2	...	...	...	...	34	...	...	...	...	0.9	6.33	...	...	...	...
High.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
H. G., 19, ♂	...	6.20	4/11	2.20	35	...	...	...	...	...	...	...	...	0.42	.....	87
Initial.....	77.2	...	...	...	...	45	...	...	...	...	0.3	7.3	...	...	...	...
Final.....	77.2	...	...	...	...	45	...	...	...	...	1.0	6.92	...	...	...	...
High.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
E. R., 20, ♂	...	5.96	4/9	2.50	35	...	...	...	...	...	...	...	...	0.75	.....	82
Initial.....	74.6	...	...	...	...	49	...	...	...	...	0.6	6.6	...	...	...	...
Final.....	74.6	...	...	...	...	49	...	...	...	...	1.1	6.5	...	...	...	...
High.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
C. P., 21, ♂	...	5.99	12/86	6.30	107	...	...	...	...	...	...	...	...	0.60	0.42/0.34	248
Initial.....	72.7	...	...	...	...	41.5	15.3	5.5	3.7	45/55	0.2	6.9	4.75 2.25	...	...	...
Final.....	74.7	...	...	...	...	41	15.0	4.8	3.6	56/40	...	6.7	4.30 2.50	...	...	...
High.....	...	...	...	...	...	...	...	...	...	...	0.3	...	...	...	...	...
J. F., 23, ♂	...	7.20	12/65	6.37	90	...	...	...	...	...	...	...	...	0.30	0.44/0.34	237
Initial.....	99.6	...	...	...	...	51	15	5.3	8.5	60/40	0.1	7.5	4.73 2.67	...	...	...
Final.....	97.0	...	...	...	...	51.5	15.8	5.3	8.5	57/43	...	7.3	4.26 3.04	...	...	...
High.....	...	...	...	...	...	...	...	...	...	...	0.5	...	...	0.30	0.44/0.34	197
A. B., 34, ♂	...	10.90	9/57	4.84	58	...	...	...	...	...	...	...	...	...	...	...
Initial.....	103	...	...	...	...	50	14.5	4.5	8.7	66/34	0.3	7.86	4.00 2.73	...	...	...
Final.....	104	...	...	...	...	53	14.5	5.0	9.6	61/39	...	7.9	4.60 3.50	...	...	...
High.....	...	...	...	...	...	...	...	...	...	...	0.5	...	...	...	...	...

TABLE 2.—E. B., Woman Aged 22, Computed Blood Volume 4.69 Liters

Date	Weight, Kg.	Trans- fusion/ Days	Total Amount Bled, Cc.	Per Cent Bled	Hemato- crit, per Cent	Reti- cytes, per Cent	Total Plasma Proteins, Gm. %	Van den Bergh Units	Bleeding, Cc.
4/9.....	52.7	...	500	10.6	34	N.	6.50	...	500
4/10.....	32	...	6.16	...	...
4/12.....	34	...	6.56	...	...
4/13.....	...	2/4	1,000	21.2	34	...	6.15	...	500
4/14.....	27.5	...	5.64	...	...
4/15.....	35	...	6.47	...	...
4/16.....	52.2	3/9	1,530	32.6	37	...	7.15	...	530
4/17.....	34	...	6.59	...	...
4/19.....	34	0.9	6.71	...	...
4/22.....	34	...	6.69	...	...
4/25.....	31	...	6.54	...	...
4/26.....	34	...	7.02	0.45	...
4/30.....	34	0.3	6.33	0.48	...
5/11.....

Minot and Lee³ in 1923 were of the opinion that several donations of 500 cc. might be given by a single donor at intervals of one week or more without disturbance. Giffin and Haines⁴ in the same year studied 84 professional donors at the Mayo Clinic and concluded that multiple donations of 500 cc. by healthy males at intervals of four to five weeks led to no harmful results. Jones, Widing and Nelson,⁵ on the

3. Minot, G. H., and Lee, R. J.: Transfusion of Blood, in Nelson Loose Leaf Medicine, New York, Thomas Nelson & Sons, 1923, vol. 4, p. 167.
4. Giffin, H. Z., and Haines, S. F.: A Review of a Group of Professional Donors, J. A. M. A. **81**: 532 (Aug. 18) 1923.
5. Jones, H. W.; Widing, Herbert, and Nelson, Lyle: Blood Donors: A Study of the Effect in Donors of Repeated Blood Loss, J. A. M. A. **96**: 1297 (April 18) 1931.

female donor is much more likely to develop postdonation anemia. Brinck and Oettinger⁶ found no anemia in donors even when blood was withdrawn repeatedly every three to four weeks. The work of Whipple and his colleagues⁷ seems to lend confirmation to this school of thought in that they found that hemoglobin regeneration in a 10 Kg. dog may be as rapid as 75 Gm. per week. At this rate a 60 Kg. man would be able to synthesize in one week six times the hemoglobin he gives with each donation.

6. Brinck, J., and Oettinger, H.: Beobachtungen an Blutspendern, Med. Klin. **33**: 307, 1937.
7. Whipple, G. H.: Protein Production and Exchange in the Body, Including Hemoglobin, Plasma Protein and Cell Protein, Am. J. M. Sc. **196**: 609, 1938.

In the more conservative school may be mentioned Martin and Myers,⁸ who in 1934 stated that donations of 500 cc. should not be given oftener than every three months, an opinion supported by Brewer⁹ on the basis of his eight years' experience with the London Blood Transfusion Service. Brewer also recommended that the interdonation interval for female donors be not shorter than four months. The more recent work of Fowler and Barer¹⁰ and of Alstead¹¹ seems to

slowly. Some of these authors attribute this less effective hemoglobin replacement to a less effective hemopoietic mechanism, although it seems to us that the menstrual blood loss alone may account for it.

Of particular interest to the present study may be mentioned the work of two teams of workers on the blood picture following multiple donations. Snapper and his Chinese colleagues¹² found in a group of 101 professional donors a large incidence of postdona-

TABLE 3—II G, Woman Aged 19, Computed Blood Volume 62 Liters

Date	Weight, Kg	Trans fusion/ Days	Total Amount Bled, Cc	Per Cent Bled	Hemato crit, per Cent	Reticu loytes, per Cent	Total Plasma Proteins, Gm %	Van den Bergh Units	Bleeding, Cc
4/28	77.2		500	9	45		7.73		550
4/29					40		7.14		
5/3		2/6	1,100	18	47				500
5/4					42				
5/6		3/9	1,600	27	44		6.95		550
5/7					45	0.8	5.73		
5/8		4/11	2,200	35	40		6.32		500
5/9					45	1.0	6.92	0.42	
5/11									

TABLE 4—E R, Youth Aged 20, Computed Blood Volume 596 Liters

Date	Weight, Kg	Trans fusion/ Days	Total Amount Bled, Cc	Per Cent Bled	Hemato crit, per Cent	Reticu loytes, per Cent	Total Plasma Proteins, Gm %	Van den Bergh Units	Bleeding, Cc
4/26	74.6		500	8.4	49		6.64		500
4/27					45		6.64		
4/28		2/2	1,000	17.6	47		7.23		500
4/29					42	0.6	6.78		
4/30		3/4	1,550	25.9	48		7.60		500
5/1					46		6.47	0.75	
5/3	74.6	4/9	2,100	35.2		0.6	6.40		500
5/4					47		6.67		
5/6					48	0.2	6.85		
5/7					40	1.1	6.50	0.52	
5/11									

TABLE 5—C P, Man Aged 21, Computed Blood Volume 59 Liters

Date	Weight, Kg	Trans fusion/ Days	Total Amount Bled, Cc	Per Cent Bled	Hemato crit, per Cent	Hemo globin, Gm	Red Blood Cells	White Blood Cells	Differential Count, Poly morpho nuclears/ Lym phocytes	Reticu loytes, per Cent	Total Plasma Proteins, Gm %	Albumin/ Globulin	Van den Bergh Units	Fragility	Bleeding, Cc
8/2	72.7		500	8.0	41.5	15.3	5,550,000	3,500	44/52						500
8/4								3,750	45/55						
8/9		2/7	1,000	17.0				4,500	52/48						500
8/11										6.9	4.75/2.25				
8/17		3/15	1,500	25.0											500
8/24		4/22	2,000	34.0						0.2	6.95				500
8/26		5/29	2,500	40.0	40	15.3	5,710,000								500
9/7		6/6	3,000	50.0											530
9/14		7/13	3,020	51.0											530
9/21		8/20	4,100	70.0											530
10/5		9/64	4,680	80.0											550
10/12		10/71	5,210	88.0											550
10/19		11/78	5,740	97.0											550
10/25		12/86	6,300	107.0											550
10/29					43	15.0	4,850,000	3,600	56/40	0.3	6.70				
11/11											6.80	4.30/2.50	0.6	0.44/0.34	
11/19	74.7														

indicate the wisdom of the present prescribed interdonation interval of eight weeks.

It is to be noted that Giffin and Hanes, and Jones, Widing and Nelson cautioned that female donors are more liable to develop postdonation anemia. Brewer believed that the interdonation period for female donors should be longer, while Martin and Myers stated that female donors regenerate hemoglobin much more

slowly. This was attributed to the undernutrition of these subjects, all of whom were in the Peiping area. Fukuda and Tominaga¹³ reported that ten to twenty donations of blood at intervals of about two weeks resulted in a decrease of hemoglobin, red cells and specific gravity of the peripheral blood. Forty to eighty such donations within two to three years led also to decreased osmotic resistance of the red cells. This amount of blood loss is considerably less than that

8 Martin, J. W., and Myers, J. T. The Effects of Blood Transfusions on Donors, *J. Lab. & Clin. Med.* 20:593, 1935.
9 Brewer, H. I. Frequency of Blood Donations, *Brit. M. J.* 1:895, 1939.

10 Fowler, W. M., and Barer, A. P. Rate of Hemoglobin Regeneration in Blood Donors, *J. A. M. A.* 118:421 (Feb. 7) 1942.

11 Alstead, S. Rate of Blood Regeneration After Hemorrhage, *Lancet* 1:424, 1943.

12 Snapper, I., Liu, S. H., Chung, H. L., and Yu, T. F. Anemia from Blood Donation. Hematological and Clinical Study of One Hundred and One Professional Donors, *Chinese M. J.* 56:403, 1939.

13 Fukuda, K., and Tominaga, Y. Einige Haematologische Untersuchungen und den in unserer Klinik Angestellten Berufsspendern, *Mitt. a. d. med. Akad. zu Kyoto* 23:708, 1938.

given by the donor in this country who donates the usual amount regularly every two months. It may be pointed out that the smaller size of the Japanese donors and the fact that undernutrition is common in Japan may play a part.

Lastly may be mentioned the paper of Cadham,¹⁴ whose work is comparable in frequency but not in quantity with our present work. He drew blood at weekly intervals from 125 poliomyelitis convalescent patients for the purpose of obtaining convalescent serum. From 65 to 140 cc. of blood was drawn from

to synthesize 78 Gm. of plasma protein a day, or the equivalent of 1,150 cc. of plasma.

Elman's¹⁶ recent report gives still more striking results. In dogs with experimental hypoalbuminemia he was able to determine that the ceiling of nitrogen utilization was equivalent to 11 Gm. of protein per kilogram of body weight daily. At this rate a 60 Kg. man would be able to synthesize 660 Gm. of protein a day. Were all this available for transfusion it would make available thirty-eight plasma transfusions, a total of over 9,500 cc. of plasma a day.

TABLE 6.—J. F., Man Aged 22, Computed Blood Volume 7.2 Liters

Date	Weight, Kg.	Trans-fusion/ Days	Total Amount Bled, Cc.	Per Cent Bled	Hemato-crit, per Cent	Hemo-globin, Gm.	Red Blood Cells	White Blood Cells	Differential Count, Poly-morpho-nuclears/ Lym-phocytes	Reticu-locytes, per Cent	Total Plasma Proteins, Gm. %	Albumin/ Globulin	Van den Bergh Units	Fragility	Bleed-ing, Cc.
8/26	90.6	....	....	..	51	15.0	5,370,000	8,500	60/40	0.4	7.5	.....	...	.....	...
8/28	530	7	..	....	....	....	....	....	....	....	...	.....	530
9/ 2	2/5	1,060	15	..	....	....	....	....	....	....	....	...	.....	530
9/ 7	3/10	1,590	22	..	....	....	....	....	....	....	....	...	.....	530
9/11	4/17	2,120	29	..	....	....	....	....	....	....	....	...	.....	530
9/18	1,860,000	6,550	50/49	0.5	7.8	.....	...	.....	...
9/21	5/24	2,650	37	..	....	....	....	....	....	....	....	...	.....	540
9/28	6/31	3,180	44	..	....	....	....	....	....	....	....	...	.....	530
9/30	5,150,000	....	....	....	....	....	...	.....	...
10/ 5	7/28	3,720	52	..	....	....	....	....	....	....	....	...	.....	530
10/12	8/45	4,250	59	..	....	....	....	....	....	....	....	...	.....	530
10/14	7.4	4.73/2.67	...	.....	...
10/19	9/51	4,800	67	..	....	....	....	....	....	....	....	...	.....	530
10/25	10/60	5,370	75	..	....	....	....	....	....	....	....	...	.....	570
10/28	11/63	5,930	82	..	....	....	....	....	....	....	....	...	.....	530
10/29	49.5	15.8	5,660,000	....	45/55	....	....	....	...	.....	...
11/ 1	12/66	6,370	89	..	....	....	9,050	....	....	....	....	...	.....	450
11/ 3	5,370,000	....	....	....	....	....	...	.....	...
11/ 5	51.5	15.8	....	8,550	....	....	8.4	....	...	0.44-0.34	...
11/22	97.0	....	....	..	..	....	....	....	....	0.3	7.3	4.26/3.04	0.3	.....	...

TABLE 7.—J. A. B., Man Aged 34, Computed Blood Volume 8.3 Liters

Date	Weight, Kg.	Trans-fusion/ Days	Total Amount Bled, Cc.	Per Cent Bled	Hemato-crit, per Cent	Hemo-globin, Gm.	Red Blood Cells	White Blood Cells	Differential Count, Poly-morpho-nuclears/ Lym-phocytes	Reticu-locytes, per Cent	Total Plasma Proteins, Gm. %	Albumin/ Globulin	Van den Bergh Units	Fragility	Bleed-ing, Cc.
9/21	101	....	530	6	50	14.5	4,500,000	8,750	60/39	....	....	....	...	.....	530
9/27	0.3	7.86	....	...	.....	530
9/28	2/7	1,060	13	..	....	....	....	....	....	....	....	...	.....	530
10/ 5	3/14	1,590	19	..	....	....	....	....	....	....	....	...	.....	500
10/12	4/21	2,000	25	..	....	....	....	....	....	....	....	...	.....	...
10/15	51	14.8	5,000,000	9,850	62/35	....	7.66	....	...	.....	550
10/18	5/27	2,610	32	..	....	....	....	....	....	....	....	...	.....	550
10/21	6/31	3,190	38	..	....	....	....	....	....	6.73	4.00/2.73	...	.....	...
10/22	560
10/26	7/36	3,750	45	..	....	....	....	....	....	....	....	...	.....	...
10/28	50	....	....	....	....	....	....	....	...	.....	550
11/ 8	8/49	4,310	52	..	....	....	....	....	....	....	....	...	.....	530
11/16	9/57	4,840	58	..	14.5	5,010,000	9,650	....	....	....	....	...	0.44-0.34	...
11/17
11/19	0.3	.....	...
11/26	101	....	....	..	53	....	....	....	62/31	0.5	7.90	4.60/3.30	...	.....	...

50 of these donors at weekly intervals with no resulting anemia but with improvement in health and gain in weight in most of them.

The rate of plasma protein regeneration has been studied mostly in the dog, and there is scarcely any literature available on human beings. The groups of workers under Whipple and under Weech¹⁵ have thrown much light on this mechanism. The quantitative work with plasmapheresis of Whipple's group has shown that the ceiling of protein synthesis in the dog on an average diet is so high that it is technically impossible to remove as much as the dog synthesizes. They have found the ceiling to be over 100 Gm. per week for a 10 Kg. dog, or over 1.3 Gm. per kilogram dog daily. At this rate a 60 Kg. man should be able

Another indirect indication of the rate of protein synthesis by the human organism may be cited for what it is worth. In treating a case of second and third degree burns involving 20 per cent of the body surface with oral amino acids as the only source of nitrogen, one of us¹⁷ found that the patient retained as much as 18 Gm. of nitrogen a day, maintaining his body weight and his plasma protein level. There is no assurance that all this was synthesized into proteins, but if one half of it had been so utilized the rate of protein synthesis would have been over 56 Gm. a day, or the equivalent of 800 cc. of plasma.

However, the ceiling of plasma protein synthesis is not necessarily identical with the ceiling of plasma

14. Cadham, F.: The Effects on Donors of Repeated Limited Blood Loss, *Canad. M. A. J.* **38**: 461, 1938.

15. Weech, A. A.: Dietary Proteins and Regeneration of Serum Albumin, *Bull. Johns Hopkins Hosp.* **70**: 157, 1942.

16. Elman, Robert; Charnas, Ray, and Davey, Harriet W.: The Ceiling of Utilization of Nitrogen: Effect of Continuous Venoclysis with the Amino Acids of Hydrolyzed Protein During Experimental Hypoalbuminemia, *Arch. Surg.* **47**: 216 (Aug.) 1943.

17. Co Tui: Unpublished data.

proteins available for donation. Another limiting factor intrudes itself, namely the development of shock on the withdrawal of more than 30 per cent of the blood volume and the slowness of reestablishment of the original volume. The study of Ebert, Stead and Gibson¹⁸ on 6 donors from whom they bled 15.5 to 19.7 per cent of their determined blood volume shows that it takes at least seven to eight hours to reestablish this lost volume and even longer for the plasma protein to return to the initial level. But even operating under these new limiting factors a man should theoretically be able to donate 55 Gm. of plasma protein a day without shock intervening. Between the present limit of 17.5 Gm. every eight weeks and the theoretical possibility of 55 Gm. daily there is a range of 18,000 per cent. Within this wide range can be found a practical level for a full but safe exploitation of what may be called the plasma resources of the donating population.

The three principal findings of the present work may be stated as follows:

(a) In spite of the fact that so large a part of the red cells has been stored extracorporeally for at least twenty-four hours, the reinfusion of these cells into the donors who have given multiple transfusions has not been followed by an increase of blood cell destruction or by anemia. In donor 4, 6,300 cc. of blood had been taken and the red cells returned during a period of twelve weeks. This amount is 107 per cent of his total blood volume.

(b) The total plasma proteins have remained at the initial level.

(c) The albumin-globulin ratio as determined chemically has remained the same.

Finding *a* may be put to immediate use. In our opinion the postdonation anemia found in women and in donors of districts with malnutrition may be controlled by the reinfusion of the red cells. Malnutrition is now widespread in China, India and many European countries. As it becomes necessary to establish blood banks in these places the reinfusion of red cells may be expected not only to protect the donors against anemia but to make it possible for them to donate with at least the frequency practiced in this country. However, it must not be concluded from findings *b* and *c* that it is now safe to bleed donors as frequently as the present donors have been bled, provided the red cells are reinfused. While it is true that neither the total plasma protein level nor the albumin fraction has suffered a reduction, we cannot form a definite conclusion as to the distribution of other protein moieties until a more extensive electrophoretic study can be made. Thus, among other constituents it would be important to know what changes, if any, have occurred in the various globulin fractions on which immunologic processes are known to depend. It is also important not only that the donors shall not suffer from any ill effects, but also that the plasma contributed shall possess the therapeutic qualities equal to those of the plasma we are at present obtaining.

In other words, while it has been shown that it is illogical to use the rate of hemoglobin regeneration as pacemaker for the frequency of plasma donations, it has not yet been determined what other blood component is the logical pacemaker. In the present study the total plasma proteins, particularly the albumin, has been assumed to play this role, but until further data

are available this must remain tentative. The problem is to find which one of the essential blood components gives way under the drain soonest: that component automatically becomes the pacemaker.

One caution, however, must be exercised in the reinfusion of cells, namely the necessity of avoiding pyrogenic reactions. The occurrence of such a complication is more serious psychologically in a donor than in a sick recipient. There are many commercial fluids which have been controlled for pyrogenicity, but where there is any doubt the pyrogen retentive filter as developed by two of us¹⁹ will insure the production of a nonpyrogenic fluid.

It may be permissible to speculate on the possibilities of this study. The American Red Cross at present utilizes a random and purely chance donor population. To obtain the 5 million units of plasma required by the armed forces would require in the neighborhood of 832,000 donors, provided each donor donated religiously every eight weeks. An increase of only one donation per donor during this period would have increased the availability of donors by 100 per cent. And, if it is finally found safe to obtain weekly plasma donations, the availability would be increased by 800 per cent! If this should be the case the entire military plasma program could be supported by a population numbering approximately 120,000.

TABLE 8.—*Tiselius Pattern of Plasma Proteins of Donor C. P. After Successive Donations*

Initial Transfusions	Albumin, per Cent	Globulin, per Cent				
		α_1	α_2	β	γ	γ
C. P. None (control)	58.2	4.3	11.3	12.9	2.3	10.3
After four.....	69.0	6.8	7.2	8.7	1.1	7.2
After eight.....	67.4	3.8	7.73	9.57	4.33	7.15
After eleven.....	58.2	3.63	7.5	13.3	7.4	10.7
After twelve....	61.1	4.18	8.36	12.68	4.75	8.93

The practical aspects of the routine reinfusion of red cells may now receive some consideration. To reinfuse the cells on the day subsequent to the withdrawal would necessitate the donor's making another trip to the bank and would not be practicable except in small towns or in such institutions as military camps or prisons, where the members are easily accessible. In blood banks which draw their donors from a population having to travel considerable distances to the bank, the drawn blood could perhaps be immediately centrifuged and the cells reinfused on the same day. This would entail a somewhat longer wait but might eliminate the problem of post-transfusion syncope. In our experience with centrifugation, most of the packing occurs in the first twenty minutes at 1,000 revolutions per minute, and thereafter the increase in packing is slight. In a program such as this so much more plasma would be made available that this small increment obtained by further spinning could be ignored altogether. This may be done with good conscience, since the plasma remaining with the cells will finally be restored to the donor in any case.

SUMMARY AND CONCLUSIONS

1. In a group of 3 donors, 1 giving three and 2 giving four full sized donations in one week, and in a second group of 3 donors giving full sized donations every week for nine and twelve weeks respectively, it was found that the total plasma protein and hemato-

18. Ebert, R. V.; Stead, E. A., Jr., and Gibson, J. G., Jr.: Response of Normal Subjects to Acute Blood Loss, with Special Reference to Mechanism of Restoration of Blood Volume, *Arch. Int. Med.* 68: 578 (Sept.) 1941.

19. Co Tui and Wright, A. M.: The Preparation of Nonpyrogenic Infusion and Other Intravenous Fluids by Absorptive Filtration, *Ann. Surg.* 116: 413, 1942.

crit returned to normal within forty-eight hours after the reinfusion of the red blood cells, after each donation.

2. The bilirubin level and reticulocyte count were found normal throughout the course of this study in all the donors. Likewise normal was the final red cell fragility test.

3. On the basis of this preliminary work (a) it is recommended that the practice of reinfusion of red cells into the donors be adopted where there is malnutrition in the donating population and/or where a large proportion of the donors are women.

4. A study is projected to determine the natural pacemaker of the frequency of plasma donations and thus to explore the feasibility of obtaining plasma at more frequent intervals than the prevailing eight week minimum.

5. It is necessary to use nonpyrogenic fluids in the reinfusions.

THE LESSONS TO BE LEARNED FROM A STUDY OF INFANT DEATHS

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The world may be in a chaotic state at the present time and it may be a very difficult period in which to live, but despite that fact less than half as many infants will fail to survive for at least one year than would had they been born in 1915, another period when war was raging over a large part of the globe.

Birth rates, total death rates and death rates for infants under 1 year of age have all shown a gradual decline during the years for which statistics are available. In 1915 the birth rate for the United States was 25.0 per 10,000 estimated population; in 1940 it was only 17.9. The total death rate in 1915 was 14.0 per 10,000 estimated population; in 1940 it was 11.0. The death rate under 1 year dropped from 99.9 per thousand live births in 1915 to 48.7 in 1940.

Had the infant death rates for 1915 prevailed in 1940 there would have been approximately 123,000 more deaths under 1 year of age during that year than actually occurred. Deaths under 1 month of age have decreased at a slightly less rapid rate (35.5 in 1927 to 29 in 1940) than those under 1 year, and those under 1 day have shown almost no decrease since 1927 (15.1 in 1927 to 13.9 in 1940), when statistics on deaths in these last two categories first became available.

Under 1 year of age there has been a decrease from almost all causes, but those reductions which have been most striking are in gastrointestinal infections and communicable diseases. The better care of food, especially milk, and the better therapy and increased prevention of contagious diseases have played a large part in the reduction of infant mortality. Infants under 1 month of age are less affected by these conditions, and those under 1 day of age not at all. Despite this decrease there has been much concern throughout the country over the relatively high death rates which still prevail during early infancy. In the last few years there has been a definite attempt on the part of the federal government through the Children's Bureau, the state and occa-

sionally city governments through the local health departments, and by the general medical profession through individual and group effort, to lower the incidence of such deaths.

Before a problem can be attacked successfully, all phases of that problem must be fully understood. The factors concerned in infant deaths are manifold and include the genetic constitution of the parents, their state of health, their social status, the environmental, emotional and physical state of the mother during pregnancy, the length of gestation, the position of the fetus in utero, the length and conduct of labor, the method of delivery, the presence of abnormalities of uterus, placenta and umbilical cord, the immediate postnatal care of the infant and the later care of the infant.

In order to do the greatest amount of good, those states which most frequently contribute to an unfavorable outcome should be first attacked. Various studies have been made dealing with different aspects of conditions related to infant deaths, but not many of these have included large series of cases and the majority have been based on clinical findings without autopsy corroboration. A notable exception to this was the study undertaken in England, the general report of which was published by Eardley Holland and Janet Lane-Claypon¹ in 1926, and the one by J. N. Cruickshank² published in 1930. The former study is based on 1,673 autopsies and clinical histories of infants and fetuses born in different parts of England, while the latter paper is based on the postmortem examination of 800 infants who died during the first month of life, who were born in the Glasgow Royal Maternity and Women's Hospital.

Cruickshank concluded that 67.5 per cent died of asphyxia, birth injury or prematurity, 29.7 per cent of infections and 2.7 per cent of developmental abnormalities. Syphilis was present in less than 1 per cent.

Within the last year two studies have been reported in the United States, one from the New York Lying-in Hospital and Sloane Hospital for Women³ and the other from the Chicago Lying-In Hospital.⁴ Each of these has included over one thousand fetal and neonatal deaths, with approximately 90 per cent postmortem examination. As would be expected, they show a remarkable similarity in the major categories of etiologic agents, as may be seen in the accompanying table.

The Chicago Health Department in 1936 instituted an intensive study of the causes of infant death. For several years there had been an attempt in that city to reduce the mortality and morbidity among infants. Causes of death had been analyzed according to the diagnoses placed on death certificates, but it was realized that in order to plan a truly constructive program more accurate information regarding the relative importance of various conditions must be found. Too many diagnoses were vague and misleading and few were supported by postmortem examination.⁵

1. Holland, E. L., and Lane-Claypon, Janet E.: A Clinical and Pathological Study of 1,673 cases of Dead Births and Neonatal Deaths, Medical Research Council, Special Report Series, No. 109, London, His Majesty's Stationery Office, 1926.

2. Cruickshank, J. N.: The Causes of Neonatal Death, Medical Research Council, Special Report Series, No. 145, London, His Majesty's Stationery Office, 1930.

3. D'Esopo, D. A., and Marchetti, A. A.: The Causes of Fetal and Neonatal Mortality, Am. J. Obst. & Gynec. 44:1 (July) 1942.

4. Potter, E. L., and Adair, F. L.: Clinical Pathological Study of the Infant and Fetal Mortality for a Ten Year Period at the Chicago Lying-In Hospital, Am. J. Obst. & Gynec. 45:1054 (June) 1943.

5. Bundesen, H. N.; Fishbein, W. I.; Dahms, O. A., and Potter, Edith L.: Factors Responsible for Failure Further to Reduce Infant Mortality, J. A. M. A. 109:337 (July 31) 1937.

From the Department of Obstetrics and Gynecology, the University of Chicago and the Chicago Lying-In Hospital.

This paper, in a symposium on "Factors in the Reduction of Neonatal Mortality," is published under the auspices of the Section on Obstetrics and Gynecology.

The Health Department obtained the support of the obstetricians, pediatricians and pathologists in the city, and autopsies were performed on the majority of infants who died under 1 year of age. These autopsy protocols were studied in relation to the clinical histories of the mothers and infants and a large amount of information was accumulated.⁶ This study is still in progress and it is to be sincerely hoped that the figures will soon be made generally available and that they may find wide application.

As a result of this study of infant deaths and stillbirths, proof was available that there were three principal channels into which efforts to reduce deaths in the neonatal period should be directed. Trained obstetricians for many years had realized the importance of these conditions and in specialized hospitals attention was being directed toward them, but in general far too few people were cognizant of them and far too few hospitals were adequately equipped and planned. The three major fields into which effort must be directed are those necessary to control the three major causes of neonatal deaths—prematurity, birth trauma and infections.

PREMATURITY

Prematurity is a direct cause of approximately one fourth of all deaths occurring under 1 month of age and is a contributing factor in at least an additional one fourth. The ideal method of decreasing the number of deaths from this cause would be in preventing the premature onset of labor; up to the present time, however, no one has succeeded in doing this except in a few isolated cases. It is necessary, therefore, to improve the environment into which the premature infant is born if its chances of survival are to be increased.

Although a premature infant may suffer and die from any of the pathologic conditions affecting an infant born at term, there are many who fail to show pathologic lesions which can be discovered by any known chemical or histologic means. If the intrauterine environment could be closely enough simulated it should be possible to save many of the infants in the latter group. The immediate reason why the majority of otherwise normal premature infants die is inability to obtain oxygen through the inadequately developed lung. The nearer the infant is to term the greater is the capillary area which is in direct contact with the alveolar lumens. Early in fetal life each entire alveolus is lined by a continuous layer of cuboidal cells. As the fetus grows, capillaries gradually branch out from the septal vessels and push their way between the cuboidal cells, thrusting them aside so that the capillaries lie uncovered in direct contact with the air spaces. If the number of capillaries in contact with the air is small and capable of receiving oxygen is too small to support life, the infant cannot survive.

The kidneys in a premature infant are incompletely developed at birth. In the average infant glomerular development continues until about the thirty-fourth or thirty-sixth week of intrauterine life, and prior to this time an incomplete complement of glomeruli are present. Even at the normal time of birth, tubular development is very incomplete and in the premature period the infant is handicapped by greater immaturity of the tubular system.

The mucosa and musculature of the stomach and gastrointestinal tract in a premature infant are less able than in an infant at term to accomplish the preparation of food for use by the body. The digestive glands are smaller and fewer in number. The anatomic state of the digestive tube, however, bears more resemblance to the digestive tube of a more mature infant than does the anatomic state of either the lung or the kidney. Instead of undergoing a definite modification in pattern the change is largely one of continuous growth following the original design.

In order to provide the infant with the greatest chance of survival it is necessary to place it in an environment which will compensate as far as possible for the incompleteness of development. The higher the percentage of oxygen which is present in the inspired air, the greater the absorption which is possible. The more easily assimilable the food which is given, the less will be the

Cause of Infant and Fetal Death

Cause of Death	New York Lying in Hospital and Sloane Hospital for Women,* per cent	Chicago Lying in Hospital,* per cent
Anoxia	19.8	28.7
Primary prematurity	18.5	14.4
Congenital malformation	14.1	11.1
Birth trauma	11.6	13.0
Infections	8.1	4.7
Erythroblastosis	2.8	2.2
Hemorrhagic disease	2.1	0.3
Syphilis	0.6	0.2
Maceration and maternal toxemia	5.2	5.3
Maceration, no toxemia	13.5	11.9
Unknown, not macerated	3.0	6.5
Miscellaneous	0.7	1.7
Total mortality	3.87	4.28
Mortality over 1,000 Gm	3.52	3.50
Total cases	1,000	1,173
Stillbirths		614
Deaths		559
Duration of Study	1935-1940	1931-1941

* Material slightly rearranged

effect of incompletely developed digestive glands. Human milk is the food of choice for all premature infants.

The epidermis gives little protection against bacteria which come in contact with the skin. Incomplete development of the body's defenses against infection make the premature infant more apt to succumb to bacterial invasion.

To give the premature infant the greatest chance for survival it should be under the care of a physician who is cognizant of its special needs, and of an attendant who is specially trained to take care of it. It should be in a place where constant heat is available for maintenance of body temperature, where humidity can be controlled to prevent undue drying of skin and respiratory system, where oxygen can be administered in order to compensate for inadequate pulmonary development, where breast milk is available in order that the least strain may be placed on the digestive system. It should be disturbed as little as possible and kept free from the possibility of infections. All clothing and bedding

⁶ Bundesen, H. N., Fishbein, W. I., Dahms, O. A., Potter, Edith L., and Volke, Walter. Factors in Neonatal Deaths, J. A. M. A. 111: 134 (July 9) 1938.

should be sterilized during laundering, all food and water should be sterile when administered, all attendants should be free of infection.

BIRTH TRAUMA

Birth trauma—the actual mechanical injury of the infant during birth—is the second principal cause of death which properly directed effort should be able to reduce. Intracranial hemorrhage is the most common form of fatal injury and is almost always due to abnormal pressure on the head. This may result from cephalopelvic disproportion, abnormal position of the head, abnormalities of uterine contractions or the improper application of forceps. Hemorrhage may be caused by any one of these conditions despite the most careful observation of the patient during the antepartum course and the exercise of the greatest skill in the management of labor and delivery. However, in general, the less adequate the training of the obstetrician and the poorer the facilities for adequate care at the time of labor and delivery, the greater the incidence of trauma will be.

Any attempt to decrease the number of birth injuries must be primarily directed toward improved education of the physician in attendance and toward improvement of the environment in which birth is accomplished. By expending effort in this direction, decreases in the number of deaths from other causes will also be brought about. There are numerous instances in which an entirely normal fetus succumbs during labor even when a hemorrhage has not occurred. The immediate cause of these deaths is usually anoxia, and, although at times due to cord and placental disturbances which are beyond the control of the physician, at other times they are associated with excessive maternal sedation or the mismanagement of complications that have arisen. The greater the skill of the obstetrician, the better will he be able to cope with all emergencies, and the fewer will be the deaths from all causes attendant on labor and delivery.

INFECTIONS

The third principal cause of death which may yield to well directed effort is infection. At the present time the lungs are the part of the body most frequently involved, although in some localities where delivery does not take place under sterile conditions there is still a high incidence of umbilical and cutaneous infections. Epidemic diarrhea takes an annual toll of lives which might be prevented if greater care was exercised in preparation of all material taken into the gastrointestinal tract.

The elimination of all pathogenic bacteria from the environment of the infant during delivery and after birth should be attempted. The less the chance of infection, the fewer infants will there be who succumb from this cause.

Except for malformations, the other conditions leading to infant death occur with considerably less frequency. This does not mean, however, that attention should not be directed to them. Although syphilis accounts for relatively few deaths in most communities, it is one cause that, with proper cooperation of patient and physician, could be completely eliminated. Abnormal fetal development, in our present state of knowledge, is almost the only condition which is not susceptible to amelioration.

PROGRAM OF CHICAGO HEALTH DEPARTMENT

Realizing that the greatest reductions in infant death could be brought about by measures directed toward the prevention of birth trauma and infections and in improving the care of premature infants, the Chicago Health Department, in cooperation with the physicians of the city, instituted a program directed toward this end. A committee, composed of representative members of various medical societies, hospital associations and the health department, drew up a set of rules governing the physical equipment and conduct of delivery rooms and nurseries and the medical and nursing care of all parturient patients and their offspring. The wisdom of these regulations was very evident and the hospitals and medical profession have cooperated to the utmost in putting them into effect. There have been a few revisions since the original code was established but they have been of minor character and, in the main, the entire program continues.

In order to assure better care of premature infants, all such infants have been cared for in especially equipped and especially staffed nurseries. An incubator ambulance is available when the infant is born at home or needs to be transported from one hospital to another. These nurseries can care only for premature infants and the methods and equipment employed must conform to the standards set up by the committee. Human milk can be obtained through the health department if it is not otherwise available. All infants are kept in the premature nursery until they weigh at least 2,500 Gm. Home conditions are investigated to make sure adequate care can be given the infant before it is discharged from the hospital. Public health nurses, if desired, are available to help the mother learn to care for her child.

The attempt to decrease the incidence of birth trauma has been primarily an attempt to improve the practice of obstetrics. Each hospital staff has arranged to have men with adequate training and qualifications available for obstetric consultation; all physicians without specialized training in obstetrics are required to obtain consultation before undertaking any type of operative procedure. The importance of antepartum care has been stressed, together with the importance of recognition and early treatment of various abnormal conditions that may arise during pregnancy, labor and delivery.

It has long been realized that infections play a major role in the production of maternal mortality, and this study has stressed their importance as a cause of infant death as well. In order to limit infections and prevent their being carried to the obstetric patient from other parts of the hospital, hospitals caring for maternity cases must have delivery rooms and rooms for convalescence of patients which are used for no other purpose. The nurses in an obstetric service and in the newborn nursery must limit their attention to such patients. The technic of care, the equipment and the physical arrangement of the nurseries are so devised that the possibility of infection through the gastrointestinal tract, skin or lungs is reduced to a minimum. An attempt is made to observe an aseptic technic comparable to that used in an operating room.

Death rates in the city of Chicago have shown a much more striking decrease than those for the country as a whole. Although the rate in 1915 (125 per thou-

sand live births) for infants under 1 year was almost 25 per cent higher than that for the registration district of the United States (99.9 per thousand live births) the rate in 1942 was 40 per cent less (Chicago 28.4 per thousand live births, United States 48 per thousand live births). The rate under 1 day in Chicago in 1940 was 10.8 and under 1 month 20.3, while in the United States as a whole it was 13.9 under 1 day, and 29 under 1 month. Had the rate for the country as a whole prevailed in Chicago in 1942 there would have been 1,345 additional deaths in that city in infants under 1 year of age. Had the city's own rate for 1916 prevailed there would have been 6,615 deaths under 1 year in excess of those which actually occurred.

On the basis of the pronounced reduction in deaths that has taken place at all intervals of the first year of life, the conclusion is warranted that steps taken to put into effect procedures which are known to aid in reduction of infant deaths will bring about desirable results. The statement is frequently made that it is impossible to determine the cause of death in the majority of infants and that little is known of the pathologic conditions affecting this age group. While it is true that a small percentage of infants die in the absence of any discernible cause, the etiologic agent, in the great majority, can be discovered without difficulty. There is a constant attempt, as is shown by the flow of papers pertaining to specific phases of the problems of parturition and early infant life, to increase our understanding of the various associated problems.

Our greatest need at the present time, however, is not for more knowledge in the possession of a few investigators but for greater dissemination of that information which is already available. When one states that the causes of infant death are little understood, it is merely an indication that one is little interested in understanding.

If all infants could be delivered by skilled obstetricians in places suitable for birth and could be subsequently cared for in a way known to give the best chance for survival, the general death rates would greatly decrease. The fact that in 1942 the rate for Chicago was 40 per cent less than that for the country as a whole indicates that at least 40 per cent of the deaths in the country are preventable on the basis of our present knowledge. There is no reason to believe, however, that even this rate represents a basic level. The physicians and citizens of the Chicago area expect to be able to continue to decrease the proportionate number of deaths year by year as they have done in the past.

What has been accomplished in this city can be accomplished anywhere if a sufficient number of people have a great enough desire.

SUMMARY

Statistical studies show that the leading preventable causes of infant deaths are prematurity, birth trauma and infections. The institution of procedures designed to combat these conditions will result in a great salvage of infant lives. That this statement is true is proved by the difference in the infant death rate for a city like Chicago, where a definite program has been carried out, and that for the United States as a whole. The death rate under 1 year of age in Chicago is 40 per cent less than that for the total United States.

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THE CARE OF THE PARTURIENT WOMAN IN RELATION TO NEONATAL MORTALITY

EARL C. SAGE, M.D.

OMAHA

It has been said that "America values group judgment." For this reason I have pooled the combined views of the pediatric and obstetric staffs of the University of Nebraska College of Medicine and have incorporated the evidence obtained from other teaching centers in this discussion.

Neonatal (first month of life) deaths approximate 70,000 annually. In 1941, the last year for which statistics are now available, fetal and neonatal deaths aggregated 144,692. This is more than the number of deaths occurring among individuals in the age group of 5 to 29 years (99,610) and is 10.4 per cent of the total deaths for all ages and all causes (1,397,642).¹ Since 1937 the infant and neonatal death rates have been declining, although the actual number of stillbirths and neonatal deaths have increased because of the increase in births from 2,203,337 in 1937 to 2,513,427 in 1941.

According to Potter and Adair² the major causes of neonatal mortality are prematurity, birth injury, anoxemia, asphyxia, infection and exposure to unfavorable

Infant and Neonatal Deaths per Thousand Live Births

Year	First Year	First Month	Second to Twelfth Months	Stillbirths
1941	45.3	27.7	17.7	29.9
1940	47.0	28.8	18.8	31.2
1939	48.0	29.3	19.3	32.0
1938	51.0	29.6	22.1	32.1
1937	54.4	31.3	23.9	33.4

conditions of external environment immediately after birth. It has been stated that neonatal mortality may be reduced more than a third, but many of these disasters are inevitable. Among the factors influencing the condition of the infant at birth Clifford and Irving³ tabulate the following:

1. Vitality of the germ plasm: congenital defects and debility.
2. Maternal abnormality: anemia, infection, dietary deficiency, heart disease, toxemia.
3. Fetal diseases: syphilis and erythroblastosis.
4. Fetal anoxemia: placental origin: gross infarction, premature separation, placenta previa.
5. Fetal maturity at birth.
6. Factors operating at delivery: cephalopelvic disproportion, length and type of labor; method of delivery: normal, low forceps, mid or high forceps, cesarean section, version, traction, suprapubic pressure.
7. Analgesia: morphine, barbiturates, ether, nitrous oxide.
8. Anesthesia: ether, chloroform, cyclopropane, nitrous oxide, local, spinal, caudal.
9. Skill and experience of anesthetist.
10. Skill and experience of obstetrician.

In that the immensity of the subject precludes a thorough discussion of all these factors relating to neonatal mortality, only a few of the causes will be considered in detail, namely asphyxia, prematurity, birth trauma and maternal complications.

This paper, in a symposium on "Factors in the Reduction of Neonatal Mortality," is published under the auspices of the Section on Obstetrics and Gynecology.

1. Daily, Edwin F.: Personal communication to the author.
2. Potter, Edith L., and Adair, Fred L.: Fetal and Neonatal Deaths, Chicago, University of Chicago Press, 1940.
3. Clifford, Stewart H., and Irving, Frederick C.: Analgesia, Anesthesia and the Newborn Infant, Surg., Gynec. & Obst. 65: 23 (July) 1937.

ASPHYXIA

According to several observers, asphyxia is the most important and frequent cause of neonatal death. The neonatal death rate has remained surprisingly constant for many years, while our pediatricians have reduced infant mortality at a rapid rate. The infant mortality rate per thousand live births was 64.6 during the first year of life in 1930 and 45.3 in 1941, while the neonatal mortality has been reduced from 35.7 to 27.7 per thousand live births during corresponding years.

As stated by Clifford,⁴ "much can be accomplished along obstetric lines to minimize the effects of unavoidable intrauterine asphyxia in some patients and to prevent the occurrence of fetal asphyxia in others." It is suggested that when advances are made in prevention and management of fetal asphyxia the result will be a significant drop in fetal and neonatal mortality and morbidity. Careful study of the complications of pregnancy which are potential causes of fetal asphyxia may result in methods of obstetric management beneficial equally to mother and to child. Irving's contribution to the management of placenta previa is an example of such an approach.

Irving⁵ studied 308 cases of placenta previa equally divided among three chronologic groups, with each group representing a different method of management. The method employed was found to exert a pronounced influence on both the maternal and the total fetal and neonatal mortality. The successful plan of treatment was as follows: Patients showing no evidence of uterine infection with infants thought to have a good chance of survival were all delivered by cesarean section; similar patients with dead infants, with infants estimated to weigh less than 4 pounds (1.8 Kg.) or with infants grossly malformed at x-ray examination were all delivered by Braxton Hicks's version or by using the Voorhees bag. Infected patients were delivered by cesarean section followed by hysterectomy with drainage, whatever the fetal condition. This plan of treating placenta previa resulted not only in a reduction of total fetal and neonatal mortality from 47 to 20 per cent but also in a reduction of maternal mortality from 12 to 2 per cent.

The prevention of fetal asphyxia demands methods of obstetric anesthesia and analgesia that do not produce fetal anoxemia or injure the fetal respiratory center. The answer to this prayer, theoretically, is continuous caudal anesthesia. In expert hands this procedure is simple, but, as stated by Mengert, "it is just as good as the man who gives it." When properly used there is no doubt that continuous caudal anesthesia for childbirth represents one of the greatest advances in modern science. This method must not be employed by those who are not adequately trained both in the administration of anesthesia and in obstetrics. With this type of anesthesia, primary respiration in the infant is established promptly, and maternal anesthesia is satisfactory without producing harmful fetal asphyxia. As Lundy⁶ remarked, "If continuous caudal anesthesia is to be employed with safety, the anesthetist must be both adept in the technic of the method and fully aware of all potentialities involved—both the desirable features and hazards. For the present, at least, the use of the

method should be confined to institutional practice by persons trained and experienced in caudal anesthesia." Caudal anesthesia requires both technical skill and institutional supervision.

A few fundamental principles in the actual therapy of neonatal asphyxia should be stressed:

1. Gentleness is of greatest importance and should be exercised in direct relation to the severity of the asphyxia.

2. A patent respiratory tract is essential. Oxygen must reach the alveoli of the infant's lungs.

3. Body heat must be maintained and in the premature infant this becomes vital.

4. There is no more rationality in slapping an unconscious asphyxiated infant than in submitting a person rescued from drowning or suffering from a fractured skull to such treatment. Similar condemnation must be made of all violent forms of resuscitation, including Schulte swinging, dilation of the anal sphincter, hot and cold tubbing and dousing with ether.

PREMATURITY

Prematurity takes precedence over almost any other primary or contributing cause of infant deaths. Many observers consider an infant premature if it weighs 2,500 Gm. (5 $\frac{5}{10}$ pounds) or less at birth. It is extremely difficult to arrive at a satisfactory classification of infant deaths, but postmortem examination should be, and could be, much more widely used than it is at present. Although necropsy may not reveal the cause of death, it is important to have the normal character of the organs established as it is to discover pathologic changes. For the past two years, at the University of Nebraska Hospital, examinations were made on 100 per cent of the stillborn fetuses and of infants who died before leaving the hospital. From July 1940 to May 1943 there were 1,224 deliveries with 66 autopsies on newborn and stillborn infants, 48 of which were equally divided between prematurity and stillbirth.

The lapse of a few minutes may determine whether a child will be born alive or dead, and, to obtain an accurate picture of the mortality in an obstetric hospital, stillbirth and neonatal (first month of life) deaths must be discussed together.

Mortality rates are much higher for premature infants than for those at term. It is well known that the mortality rate of premature infants increases decidedly in the low birth weight group. Bundesen and his co-workers⁷ of the Chicago Board of Health, in studying 1,643 infant necropsies, found that the largest single cause of death was prematurity (premature infants without demonstrable pathologic lesions), with intracranial hemorrhage and malformations comprising the other two large groups. It should be remembered that no fetal autopsy is complete without examination of the placenta. The fetal surface should be examined for hematomas, tumors and excessive degenerations. The maternal surface may show evidence of infarcts or of compression caused by blood clots which resulted from premature placental detachment. Then serial sections should be cut through the entire thickness of the placenta. Prematurity in itself should not be considered an acceptable cause of death until other possibilities have been eliminated.

The incidence of prematurity in any series of deliveries is usually between 5 and 6 per cent. The

4. Clifford, Stewart H.: *Asphyxia of the Fetus and the Newborn Infant*, Proc. Am. Cong. Obst. & Gynec. (1939) 1: 258, 1941.

5. Irving, F. C.: *A Study of Three Hundred and Eight Cases of Placenta Previa*, Am. J. Obst. & Gynec. 32: 36 (July) 1936.

6. Lundy, John S.; Adams, R. Charles, and Seldon, Thomas H.: *Continuous Caudal Anesthesia or Analgesia*, J. A. M. A. 122: 152 (May 15) 1943.

7. Bundesen, H. N.; Fishbein, W. I.; Dahms, O. A.; Potter, Edith L., and Volke, Walter: *Factors in Neonatal Deaths*, J. A. M. A. 111: 134 (July 9) 1938.

neonatal mortality for premature infants was 20.7 per cent in contrast to 0.9 per cent for term infants delivered at the Chicago Lying-In Hospital in the period between 1931 and 1939.

If mortality is calculated in relation to weight at birth, the increased likelihood of survival with increasing weight is clearly shown. In 1935 Dunham⁸ of the U. S. Children's Bureau showed that the mortality of 3,881 premature infants delivered in six large obstetric hospitals was 95 per cent when the infants weighed under 1,000 Gm., 71.5 per cent when the infants weighed from 1,001 to 1,500 Gm., 32.5 per cent when the infants weighed from 1,501 to 2,000 Gm., and 8.7 per cent when the infants weighed from 2,001 to 2,500 Gm. The total mortality for the entire group was 25.3 per cent. Until some method of preventing premature labor is discovered, this will continue to be one of the largest contributing factors in the production of neonatal deaths. According to Potter and Adair² the combined neonatal death rate and intrapartum stillbirth rate for premature infants is approximately eighteen times as great as the rate for those at term.

Miller⁹ found that the birth weight of the premature infant is the single factor almost without exception that determines the survival of the infant, whether delivered spontaneously, by low forceps, or by cesarean section. Other pertinent observations of Miller are:

1. Any increase in the incidence of prematurity will increase the neonatal mortality rate and hence the total infant mortality rate, regardless of the method of delivery
2. The high incidence of premature births found among cesarean deliveries in this study was shown to be due to the fact that mothers with certain complications of pregnancy were delivered by this method most frequently.
3. To discuss neonatal or total infant mortality rates without considering the full term infant as a distinct entity can only add to an already confusing problem.
4. The determining factor in the survival of the full term infant is the complication of pregnancy in the mother, rather than the type of delivery used.

The treatment of the premature infant presents four major problems: (1) maintenance of body temperature, (2) proper nutrition of the infant, (3) prevention of cyanotic attacks and (4) prevention of infection.

BIRTH TRAUMA

Potter¹⁰ stated that in a broad sense the term "birth trauma" may be used to include any condition which affects the fetus adversely during labor or delivery. In a stricter sense it is probably better to reserve this term to hemorrhage resulting from contusions and lacerations or fractures caused by mechanical factors.

The intracranial cavity is the most common site of fatal traumatic lesions in the fetus. Distortion of the shape of the fetal head as it passes through the birth canal may cause a laceration of the vein of Galen or the membranes which support the brain. Hemorrhage results, and death is usually due to the effect of increased cranial pressure on the respiratory center. Vitamin K will not stop these massive hemorrhages, but there is basis¹¹ for the belief that certain infants have a tendency to bleed following relatively minor

trauma and that unusually high prothrombin times may well account for such unnatural tendencies to bleeding. Vitamin K administered intravenously to the mother before delivery effectively prevents prothrombin deficiency in the newborn infant and probably serves to check such bleeding and to render harmless a slow oozing hemorrhage. Our staff members employ vitamin K routinely in all labors and believe that this therapy is particularly valuable when the infant is likely to be premature; also in prolonged labors or if operative delivery of any type is anticipated.

Interference with transfer of oxygen through the umbilical cord from any cause will result in injury to fetal tissues and, if sufficiently severe and prolonged, will cause death. The practice of abnormally prolonging the second stage by pressure on the perineum during general anesthesia should be discouraged, as it may produce a serious degree of fetal asphyxia. Conversely, if the cervix is fully dilated, shortening of the second stage of labor by low forceps delivery and episiotomy may reasonably be expected to reduce the incidence and degree of fetal asphyxia (Clifford⁴).

Potter¹⁰ has pointed out that different methods of delivery show definite variation in the incidence of intracranial hemorrhage. When the total death rate for each type of delivery and the incidence of intracranial hemorrhage are both taken into account it was found that 1 out of every 25 infants (4.3 per cent) delivered by version and extraction is born dead or dies in the neonatal period. The next highest mortality from intracranial hemorrhage is found in delivery by mid and high forceps, 1 in 33 (3.2 per cent), and is followed by breech delivery with 1 in 50 (2.2 per cent). The incidence is considerably lower in the remaining types of delivery: cesarean section 1 in 110 (0.9 per cent), low forceps 1 in 330 (0.3 per cent), natural cephalic delivery 1 in 500 (0.2 per cent).

In breech deliveries, more bad results have come from attempting to deliver through an undilated os and against a resistant cervix than from any other single cause. The practice of pulling with forceps against a resistant cervix has resulted in injury to the fetal head as well as in severe laceration of maternal soft parts and is to be condemned. The function of forceps is not that of dilation.

MATERNAL COMPLICATIONS AFFECTING NEONATAL MORTALITY

There is a high incidence of prematurity, stillbirth and neonatal death in parturient women with hypertension, albuminuria or edema during pregnancy, probably accounted for by placental lesions such as infarction and premature syncytial degeneration.¹² In a series of 52 toxemia of pregnancy patients in 1,091 obstetric admissions at the University of Nebraska Hospital from April 1940 through July 1942 we encountered 9 fetal deaths, nearly all stillbirths, a fetal mortality of 17 per cent.

Dieckmann and Brown¹³ reported a fetal mortality of 5 per cent in mild cases of eclampsia and 25 per cent in severe cases of preeclampsia. Corwin and Herrick¹⁴ reported a fetal mortality of 12 per cent in mothers with mild preexisting hypertension and 69 per cent

8. Dunham, Ethel: Personal communication to Potter and Adair: *Fetal and Neonatal Deaths*, p. 121.

9. Miller, Herbert C.: The Effects of the Various Methods of Delivery on Fetal and Neonatal Mortality Rates, *Proc. Am. Cong. Obst. & Gynec.* (1939) 1: 303, 1941.

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11. Bohlender, George P.; Rosenbaum, W. M., and Sage, E. C.: Intrapartum Use of Vitamin K, *J. A. M. A.* 116: 1763 (April 19) 1941.

12. Dexter, Lewis; Weiss, Soma; Haynes, Florence W., and Sise, Herbert S.: Hypertensive Toxemia of Pregnancy, *J. A. M. A.* 122: 145 (May 15) 1943.

13. Dieckmann, W. J., and Brown, Ira: Hypertension and Pregnancy, *Am. J. Obst. & Gynec.* 36: 798 (Nov.) 1938.

14. Corwin, J., and Herrick, W. W.: The Toxemias of Pregnancy in Relation to Chronic Cardiovascular and Renal Disease, *Am. J. Obst. & Gynec.* 14: 183 (Dec.) 1927.

in severe cases of the same condition. Tyson and Bowman¹⁵ showed that, provided the fetus survived the neonatal period, there were no demonstrable ill effects later from preeclampsia and eclampsia. Dexter and his co-workers¹² did not detect hypertension or water retention in the newborn babies of toxemic and edematous mothers.

Mussey and Hunt¹⁶ reported 225 cases of toxemia of pregnancy treated by conservative management of pregnancy and parturition. Fetal mortality may be as high as 50 per cent in cases of severe cardiovascular disease with nephrosclerosis as compared to 3.5 per cent in cases of mild preeclampsia and 19.3 per cent in cases of severe preeclampsia. There were no fetal deaths in 13 cases of mild chronic hypertensive disease with superimposed mild preeclampsia. These authors remark that the probability of survival among babies born to women suffering from severe toxemia is decidedly less than normal; this is especially true of premature babies. Continuation of pregnancy to term, however, may not be desirable, as the fetus may die in utero if overwhelmed by the maternal disease in the course of more or less severe toxemia.

Plass¹⁷ reported 80 cases of eclampsia with the survival rate among the 84 infants (four sets of twins) as 53.6 per cent, the infant mortality amounting to 46.4 per cent. The toxemia appears, therefore, to have been the direct cause of the high fetal death rate either by inducing or necessitating premature delivery or by producing intrauterine fetal death. Exclusion of all "previable" children weighing less than 1,500 Gm. reduced the fetal and infant fatality rate in this series to 33 $\frac{1}{3}$ per cent.

Fortunately the incidence of toxemia of pregnancy in the United States is declining. The maternal mortality rate from toxemias is low in Nebraska (3.6 per 10,000 live births), the only other states having a lower percentage being North Dakota, Oregon, Rhode Island and Idaho in the order named.

Peckham¹⁸ studied 623 consecutive cases of toxemia of pregnancy in their relation to fetal mortality and concluded that "it might well be inferred that, in a toxemia severe enough to cause some concern for the mother, the result to the child is sufficiently hazardous so that temporizing with the patient for the sake of the offspring is not justifiable." The fetal mortality in patients who developed the toxemia during the last month of pregnancy was low, 2.84 per cent. A steady increase obtained with each month of earlier development. In two fifths of the women in whom the toxemic process developed prior to the seventh month but carried to a period of theoretical viability, the child was either stillborn or died in the first two weeks of life. Conversely, the highest fetal mortality figures were found in patients allowed to progress the longest time between the development of toxemic signs and the delivery of the child. The risk to the fetus increased directly with the length of time elapsing between the onset of the toxemia and delivery. A total fetal mortality percentage of over 25 prevailed in this series of 623 consecutive deliveries of patients suffering from the various toxemias of pregnancy.

The fetal mortality in eclampsia was 48 per cent. The fetal mortality for the general clinic population was 5.5 per cent.

Bloxson¹⁹ reviewed 100 consecutive cases of cesarean section to study the effect of different factors on asphyxia of central origin occurring in the infants. Forty-two infants had varying degrees of asphyxia, which was fatal in 6 cases. Three of the six deaths were of premature infants with especial susceptibility to asphyxia. When infants were allowed a test of labor, the incidence of asphyxia showed a decrease of 25 per cent. This observer felt that the failure to condition the infant mechanically by uterine contractions or passage through the birth canal was responsible for many cases of asphyxia. He recommended that (1) the infants should be at full term, if possible before cesarean section is done, (2) no analgesic should be administered to the mother before cesarean section, (3) local or spinal anesthesia should be employed if possible in the interest of the infant and (4) if time permits, and there are no contraindications, the mother should be allowed to have some labor pains.

Irving's² contribution to the management of placenta previa has already been mentioned with the reduction of total fetal and neonatal mortality from 47 to 20 per cent.

Falls²⁰ recently reported 97 cases of premature detachment of the placenta with a fetal mortality of 20 per cent. Tabares y Boyez²¹ reported 62 cases of the same condition with a fetal mortality rate of 85.48 per cent. Cosgrove and Conway²² reported 236 cases of premature separation of the placenta with a total fetal death rate of 49 per cent. It is evident that abruptio or ablatio placentae is one of the gravest accidents with which the obstetrician has to deal and accounts for many fetal deaths. When the placenta is completely detached the maternal mortality is from 5 to 10 per cent, and from 95 to 100 per cent of the infants are lost. In a partial detachment of the placenta, when the fetus is viable and proper equipment and personnel are available, a timely cesarean section may be done in the interests of the child.

In the management of pregnancy complicated by heart disease, tuberculosis, diabetes, some of the anemias, hyperthyroidism, chronic infection of the urinary tract and antepartum hemorrhage, induction of premature labor may, and often does, prove to be the wisest and most rational and effective treatment. The inescapable by-product of these problems is a premature baby. Is it not preferable to deal with a premature baby and a live mother who in many instances may have been saved from an untimely death or from serious impairment of health, rather than risk and perhaps lose the lives of both?

Any discussion of maternal complications which affect fetal and neonatal mortality would be incomplete without mention of certain major problems concerning which our knowledge is all too inadequate. Such problems, including the initiation and mechanism of labor, premature labor, premature rupture of membranes, primary uterine inertia and the physiology of fetal respiration, offer fertile fields for further investigation.

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SUMMARY AND CONCLUSIONS

1. Neonatal deaths (first month of life) approximate 70,000 annually in the United States. Total fetal and neonatal deaths in 1941 totaled 144,692.

2. Since 1937 the infant and neonatal mortality rates have been declining, although the actual number of neonatal deaths and stillbirths has increased because of the increase in births.

3. The infant mortality rate for the first year of life in 1941 (U. S. Bureau of Census statistics) was 45.3 per thousand live births, reduced from 64.6 in 1930. This is a reduction of 19.3 per thousand live births as compared to 1930.

4. By contrast the neonatal mortality was 27.7 per thousand live births in 1941 as compared to 35.7 in 1930, a reduction of only 8 per thousand live births. This is a creditable record of progress, but it can and will be improved on. The reduction of neonatal mortality is largely the responsibility of the obstetrician, but the pediatrician likewise has a joint responsibility. The realization of our joint responsibility toward neonatal problems is one of the most encouraging advances made in this field.

5. A knowledge of the anatomic, physiologic and chemical peculiarities of the newborn is essential to an adequate understanding of neonatal problems and indispensable in their proper care.²³

6. Pathologists, physiologists, obstetricians, pediatricians and anesthetists have collaborated in the study of anoxia and asphyxia. As obstetricians we must make a careful study of the complications of pregnancy which are potential causes of fetal asphyxia, and these studies may result in methods of obstetric management equally beneficial to mother and to child. We have the welfare of 2 patients under consideration.

7. All known analgesics and anesthetics administered to the mother have a certain degree of injurious effect on the fetus (in proportion to the amount administered) with the exception of continuous caudal anesthesia. The ultimate evaluation of any given method of anesthesia will depend on the price paid for the mother's comfort in terms of infant mortality.

8. A few fundamental principles in the actual therapy of neonatal asphyxia should be stressed, namely gentleness, patency of the respiratory tract, use of oxygen, maintenance of body heat and avoidance of rough handling of the infant. Primary oxygen want is responsible for many fetal deaths.

9. Prematurity is one of the most potent contributory factors in neonatal and infant mortality and is the most important single factor in the causation of neonatal asphyxia. Prematurity in itself should not be considered an acceptable cause of death until other possibilities have been eliminated. Postmortem examination should be, and could be, much more widely used in this respect. The incidence of premature births is usually between 5 and 6 per cent. Obstetric analgesia with morphine, scopolamine or phenobarbital should be avoided when dealing with a premature infant, as it interferes seriously with the respiratory function of the infant.

10. If mortality is calculated in relation to weight at birth, the increased likelihood of survival with increasing weight is clearly shown. We must understand the importance of prolonging intrauterine life as

long as safety for the mother will permit, to increase the viability of the prematurely born infant.

11. Recognition of the joint responsibility of obstetrician and pediatrician will tend toward a clearer understanding of the hazards associated with the adjustment of the premature infant to extrauterine life. Especial emphasis should be placed on maintenance of body heat, prevention of cyanosis, prevention of infection and proper nutrition.

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THE CARE OF THE FETUS
DURING LABOR

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This paper is based on the management of the labor in 6,000 women about equally divided among Caucasian and Negro. Most were clinic patients who had inadequate antepartum care and many none at all. Some came from a great distance and had been neglected in long preliminary labor, often accompanied by unsterile vaginal examinations.

Uppermost in the therapy of each individual case was the ambition to recover a live and uninjured mother, but early in the series more and more interest was taken in the care of the fetus, and time and energy were counted as not wasted in devising methods to enhance its welfare and, in spite of its often bleak cultural and economic outlook, to saving it in addition to the mother. The fullest satisfaction was derived from obtaining a live mother and a live and healthy infant where the outlook was most hopeless. These methods, most of which are common knowledge if not in common usage of the profession, will be outlined in this thesis. In passing, however, it is not amiss to state that conservative measures have proved more valuable than more radical ones, and most fortunately, as a rule, those benefiting the mother have been the ones best for the fetus.

TEST OF LABOR

Paramount in the management of labor is the possession of a distinct and inclusive definition of a test of labor. A perusal of the pertinent literature reveals extreme confusion.¹ In 1933 Rudolph divided the authorities on the subject into two classes, one anatomicophysiologic who defined a test of labor as one beginning at the full dilatation of the cervix and defined in number of hours of "second stage labor." The other, the clinical school, defined test of labor as a variable number of hours of uterine pains. As seen from several paragraphs from Rudolph's article, variability is the only characteristic common to all the definitions. No wonder some technically trained experts glibly license themselves to do all sorts of operative procedures on the defenseless parturient! As the time honored word implies, labor is a physiologic procedure in which the chief factor is the amount of foot pounds of energy expended. This energy is mainly expended to increase intermittently the hydrostatic pressure within the uterus. The pressure is transmitted equally throughout the

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1. Bailey, H.: *Am. J. Obst. & Gynec.* 12:550 (Oct.) 1926. King, E. L., *ibid.* 25:482 (March) 1938. Rudolph, Louis, *ibid.* 25:840 (June) 1933.

23. Parmelee, A. H.: The Pediatrician Looks at Obstetric Analgesia and Anesthesia, paper read at the Symposium on Obstetric Analgesia and Anesthesia, University of Nebraska College of Medicine, May 28, 1943.

uterus so that the bulging membranes, and later the head, act as tampons to help dilate the cervix. The effectiveness of this process is influenced greatly by many factors. These include size of presenting part, size of pelvis and the ease of dilatation of the cervix. Rudolph states that the ease of dilatation of the cervix is dependent on the presence of retraction by maintained contractions of the longitudinal muscles of body of the uterus. If this is true, the uterus progressively after each contraction should become more firm. Yet even in the latter part of the first stage the normal uterus is soft between contractions. Further studies should be devoted to determine factors which influence the ease of this process.

In normal uterine contractions the muscle of the uterine wall slowly contracts firmly for a period of about forty seconds, raising the intrauterine pressure to 30 or more millimeters of mercury, and then slowly relaxes to a resting stage of a minute and a half up to five or more minutes. The intrauterine pressure between contractions is normally 5 to 10 mm. of mercury. In some patients between contractions the tone of the uterus is maintained high at 10 to 20 mm. Yet the contractions may or may not differ in amplitude and frequency from the normal. These high intrauterine pressures between contractions have been observed (1) in patients diagnosed as presenting the dystocia dystrophy syndrome, even in those without cephalopelvic disproportion and (2) in patients who had received oxytocics.

Now during the second stage of labor, i. e. from full cervical dilatation to delivery of the fetus, there is a second source of energy applied from the partially voluntary contractions of the abdominal muscles which merely increases the intrauterine pressure by a maximum of 40 to 100 mm. of mercury. This increased pressure is usually enough to expel the fetus in two hours or less. During the second stage the amount of pounds pressure effective in propelling the infant and produced by the uterus has been calculated to be 10 to 20, and the amount added by the abdominal muscular contractions has been calculated to be 10 to 28, making a total of 20 to 48 pounds.²

From the very first in the study of the series of labors, an effort was made to determine a labor test that (a) practically all parturients and their fetuses could tolerate, (b) 95 per cent of whom would be delivered spontaneously before its completion and that, after taking the test and failing, both mother and child would be able to survive the artificial delivery measures necessary. The trial and error method gradually reduced the difference between a test too strict and one too lenient but never did entirely eliminate clinical judgment, and the final test, therefore, is somewhat elastic. After six years of study in 6,000 deliveries the test evolved thus: Test of labor includes uterine contractions lasting forty seconds every two to five minutes over a period of time of twenty to twenty-four hours with noticeable progress, the parturient being supported meanwhile with water, dextrose, vitamins and oxygen if necessary, plus proper sedation. At the end of this period in most instances the fetus will have been born; in those not, the head will be at least in midpelvis, where it may be delivered by forceps, or still floating, when low or extraperitoneal cesarean section may be done safely. By following this rule, one

can reduce operative delivery to about 3 per cent, forceps delivery approximately two and one half per hundred and cesarean section once in 200 cases. Version and extraction are reserved for transverse presentation only. These results are approximately those given by McCord,³ Hillis⁴ and Kay.⁵ No one can deny that their results were good.

Because of the ever present possibility of necessity for cesarean section, no vaginal examinations were done and a watery solution of an antiseptic was instilled into the vagina every four hours during labor. There was some evidence of its value; at least it could do no harm. One can be trained to learn nearly as much from rectal examination as from vaginal.

During the course of labor there are two important considerations, (1) the degree of progress and (2) evidences of exhaustion of either mother or fetus. The progress may be determined by rectal examination and expressed in terms of dilatation and effacement of the cervix and the descent of the presenting part. Exhaustion of the mother is made evident by dehydration, rapid pulse rate, undue restlessness and alterations in uterine contractions and, very rarely, development of a contraction ring in the lower uterine segment. For the fetus, changes in the heart rate, especially slowing or irregularity, indicate hypoxia. All types of exhaustion in either of the patients are best treated by hydration, dextrose, vitamins, oxygen and sedation rather than by forced delivery, as is far too often employed.

No woman in labor has been seen who has not been able to tolerate this test, provided reasonable attention has been paid to the therapeutic measures mentioned. No fetus has been seen that could not safely survive this test except in case of complications as prolapse of cord, prolapse of arm in transverse presentation or extensive premature separation of the placenta. In the definition of the test no mention was made of the condition of the cervix. However, full dilatation for between two and three hours should precede forceps delivery, and, if the uterine contractions are far apart and progress is being made, a longer time may be allowed. Forceps operation is considered to be very simple, yet even in the hands of experts injuries occasionally occur and, as a rule, far more often than when the fetus is allowed to deliver spontaneously or with Kristellar expression, plus episiotomy, if indicated.⁶

The labor test must be quite rigidly applied in each case, otherwise unnecessary operations will be done. Illustrating this point is one of our prize cases:

A Negro girl, A. W., first came under our care, pregnant at term in her fifteenth year. Her pelvic inlet by the grid method of x-ray measured anteroposterior 9.25, lateral 10.25, outlet normal. The fetus was large and the head floated above the inlet. Our rule is that each patient deserves a full test of labor if the pelvic inlet is anteroposterior 9 cm. or more. She went into labor with most of the staff insisting on a cesarean operation, and at seventeen hours the head still floated. Nevertheless we decided to wait for twenty hours and we went to the dining room to have dinner before any operative procedure. While there we were hastily summoned and found that she had precipitated in bed. The infant breathed spontaneously and weighed 8 pounds 5 ounces (3,770 Gm.), and the head measured biparietal 9 cm. and suboccipitobregmatic 10 cm. Since then she has delivered four more children of the same size, the earlier of which were born with long first stages of

3. McCord, J. R.: *South. M. J.* 28: 53 (Jan.) 1935.

4. Hillis, D. S., and Benensohn, S. J.: *Am. J. Obst. & Gynec.* 36: 427 (Sept.) 1938.

5. Kay, J. B.: J. M. A. Georgia, to be published.

6. D'Esopo, D. A., and Marchetti, A. A.: *Am. J. Obst. & Gynec.* 44: 1 (July) 1942.

2. Woodbury, R. A.; Hamilton, W. F., and Torpin, Richard: *Am. J. Physiol.* 121: 640 (March) 1938.

labor and short second stages. However, subsequent x-ray studies of the inlet revealed that it gradually became larger and now each of the diameters has increased 1 centimeter to anteroposterior 10.25 and lateral 11.25 cm.

During labor what is to be done for the fetus? Few textbooks have given the subject much consideration. Moreover, the fetus is subject to exhaustion quite parallel to that of the mother and often to some factors not affecting her. Both need plenty of fluid. Dextrose is the most easily assimilated food and is most valuable and often neglected. Oxygen administered to the mother is of prime use for the fetus, and, when there is evidence of actual or impending fetal exhaustion, oxygen should be administered constantly. The conditions which reduce the oxygenation of the maternal blood stream are convulsions or coma of eclampsia, pneumonia and other infections, anemia, cardiac decompensation, morphine and other drug depression. Besides these there are conditions in which the oxygen of the maternal blood stream may be adequate ordinarily, but the fetus has reduced ability to obtain or use it, such as premature separation of the placenta, placenta previa, cord entanglements, prolapse of the cord, some cases of velamentous insertion of the cord, and hypertonicity of the uterus, which sometimes may be so extreme as to be tetanic. In all these conditions oxygen may be life saving for the fetus, tiding it over until delivery. Nothing is more dramatic than the improvement in the depressed fetal heart rate by administration of oxygen to the mother. By administering it to all eclamptic patients in convulsions or coma, the fetal salvage rate may be greatly augmented.

Furthermore, the fetus is benefited by x-ray studies, which, if carried out as here outlined, are inexpensive enough to be done routinely in any office or clinic. Only by routine use can the best results be obtained. Using a positioning frame placed on the x-ray table, as devised at the University of Georgia School of Medicine, the grid film, as worked out by Thoms, is made in a few minutes by any technician. (At night medical students here do very well.) By use of the frame, 8 by 10 inch film may be used and patients in labor are as easily positioned as patients in earlier pregnancy. This film is made at eight months for all private patients. The reason for this is not only to determine the size of the pelvic inlet and some idea of the outlet, but also to be sure that the presentation is cephalic and that there is not anencephalus, a condition not infrequently diagnosed by this method. The knowledge that she has a large pelvis and normal presentation more than compensates for the cost to the mother. For clinic patients this is done not at eight months but when they enter the hospital in labor. X-ray films are made routinely only for primiparas, and for multiparas only if complications are developing. In addition, during labor of all primiparas and selected multiparas a lateral soft tissue 14 by 17 inch film is made, as described by Snow⁷ and by Dippel and Brown.⁸ This indisputably gives the presentation of the fetus, presence or absence of gross osseous malformations and degree of descent of the presenting part. By use of a simply devised centimeter marked lead ruler strapped longitudinally over the abdomen as close as possible to the fetal head, its biparietal or suboccipital bregmatic diameter may be measured to within 5 per cent error.

Consequently from these quickly made and inexpensive studies most of the guesswork is eliminated and the obstetrician may accurately prognosticate complications in labor in all but the cases in which there is dystocia due to resistance of the soft parts and ineffectual uterine contractions. But knowing the exact size and shape of the inlet and the approximate outlet, the true presentation, the degree of flexion of the presenting part and the degree of descent of the presenting part, he is armed with far greater aids in managing the dystocias of other origin and, most valuable of all, he can outline the campaign of labor more intelligently. Consequently the management of labor becomes a science as well as an art. A further aid in the use of x-rays as described is that all reports are briefly stated in accurate terms. The roentgenologist does not have to present his opinions and thereby become an obstetrician. However, it is probably better if the obstetrician also reads the films of his own patients. A few time tried rules are applicable:

1. Test of labor is given to all parturients who have an inlet, anteroposterior diameter of 9 cm. or more, even if there is also present considerable narrowing.
2. If the anteroposterior is less than 9 cm. no one could be criticized for doing early cesarean section. However, most babies will deliver safely through a pelvis whose anteroposterior inlet is above 8 if it is accompanied as usual by a wide inlet, as is characteristic of platypelloid pelvis. On the other hand it is astonishing how few women, colored or white, other than dwarfs, have anteroposterior inlets less than 9. (Probably one or two occur in a thousand.) Not infrequently fetuses deliver normally whose biparietal diameter is equal to the anteroposterior inlet diameter of the pelvis.
3. A narrow outlet as seen in the inlet grid film by noting the degree of inward protrusion of the ischial spines occasionally causes dystocia, especially if the occiput presents posteriorly. The spines hold the head and prevent its rotation. Half of the infants delivering direct occiput posterior had this as an etiologic factor. The other half were found to be associated with rapid labor through a justomajor pelvis with nothing to make them follow the usual mechanism of labor.
4. If the placenta is on the anterior wall of the uterus there is increased chance for the fetus to present with the occiput posterior.

ANESTHESIA IN LABOR

In this day and age some sort of amnesia, analgesia or anesthesia in labor is necessary as well as prudent. Probably all the methods have on occasion some deleterious effect on the fetus, one of the older of the modern methods, twilight sleep (morphine and scopolamine) having gained a notorious reputation for its blue babies, and the youngest, continuous caudal analgesia, being associated with a high incidence of forceps deliveries. Very likely the method most universally used is that of amnesia produced by the shorter acting barbiturates and scopolamine. Properly administered, the latter has the advantages of being less depressing to the fetus than some of the others and of being quite easily administered and usually quite satisfactory from the mother's point of view. Infants are depressed in some cases, some being apparently more susceptible than others, and if inhalation anesthesia, as ether or cyclopropane, is used in the late second stage, the infant may be very depressed, as it is also in case of additional difficult operative delivery. Consequently with the use of barbiturates and scopolamine, it is well to use infiltration of 0.5 per cent procaine in the perineum if episiotomy is done or if forceps are used. Continuous caudal analgesia, like local infiltration of procaine, may be as little depressing to the fetus as no anesthesia at all. The latter long has been recognized as the best

7. Snow, W. J., and Rosensohn, Meyer. *Am J Roentgenol.* 42: 709 (Nov.) 1939.

8. Dippel, A. L., and Brown, W. H. *Bull Johns Hopkins Hosp.* 66: 90 (Feb.) 1940.

for the fetus. This fact has prevented many obstetricians from embracing any attempt at anesthesia other than a few "whiffs" of an inhalation anesthetic agent at the end of the second stage. Continuous caudal analgesia has the added disadvantage of requiring expert administration and constant skilled supervision, often for many hours. Otherwise infection and other complications may arise. Whether or not analgesia or amnesia has been induced, the obstetrician should be ready to maintain oxygenation of the fetal blood after birth until the respiratory depression is overcome.

Caudal analgesia may be ideal in case of bag insertion, to be followed by operative delivery, thus eliminating double anesthesia. Meconium stained amniotic fluid was present in a number of cases of our series under continuous caudal analgesia. The fetuses cried immediately at birth and hypoxia was not present. Potter and Adair⁹ have shown that hypoxia was the factor in 40 per cent of fatalities in more than a thousand fetal deaths. Almost all recent writers on the subject

until a proper surgical operation can repair the defect. We had one serious brain hemorrhage in which the neurosurgeon evacuated the collection of blood and the infant immediately recovered fully from paralysis and convulsions. Certainly in our hospital many depressed infants have been revived by this method of insufflation. The technic is easily learned on a stillborn fetus. With the judicious use of amnesia and analgesia, probably one in ten or fifteen newborn infants needs insufflation. Otherwise the deep cyanosis which develops is almost certain to be accompanied by cortical cell damage due to hypoxia, which may alter the whole future course of the individual's life, as has been suggested by Schreiber,¹¹ Yant¹² and Courville.¹³

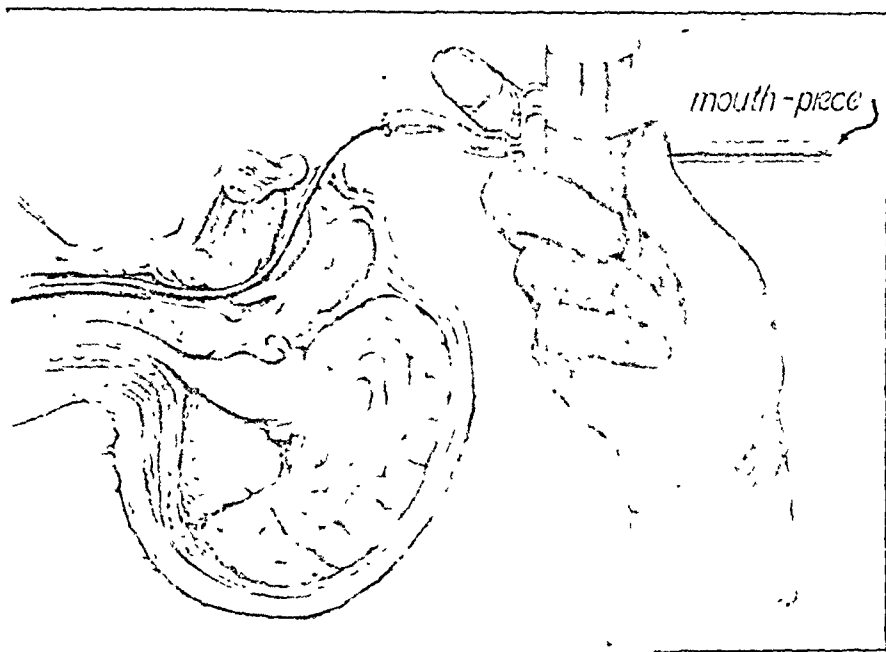
THE FETUS IN SPECIAL OBSTETRIC COMPLICATIONS

In prolonged labor, while the welfare of the mother is supreme, that of the infant should not be neglected. By x-ray studies as outlined, prolonged labor may be anticipated in certain pelvic deformities as shortened inlet, anteroposterior diameter or narrow outlet, or by malpresentation, such as transverse, prolapsed arm or hand, breech or occiput posterior presentations, the last two being only relatively abnormal.

Aside from these there are a group of patients, usually short, tending to be obese, often with masculine characteristics well described by Horner¹⁴ and others as dystrophia dystocia syndrome, previously named dystocia adiposogenitalis. Often these have contracted pelves, but in a rather surprisingly large percentage the pelvis is normal in contour and size. In other words, many are dystocias of uterine origin—some are labeled cervical dystocias. The management of these is conservative if no disproportion can be made out by x-ray examination. A test of labor given with proper sedation and support by sugar, water, niacin and thiamine and oxygen discloses at the end of twenty to twenty-four hours whether the fetus is able to deliver by the vagina; if not, cesarean section, low type or extraperitoneal, is indicated.

Usually at the end of the test one is quite able to determine the future progress of the labor, the head being in midpelvis and the cervix dilated or dilatable by bag. It is to be noted that when vaginal examinations have been done early in such labors there is a definite tendency for infection of the amniotic fluid and development of foul odor, in which event the incident of fetal death is increased.

Therapeutic measures in long labors are in general conservative: maintenance of hydration, nourishment in the form of dextrose and vitamins and extra supply of oxygen whenever there is a tendency to cyanosis of the mother or irregularity of the fetal heart beat. We believe vaginal instillation of a watery solution of antiseptic tends thus to prevent the increased fetal mortality in prolonged labor due to infection. Special features should include knowledge of size and contour



Sagittal section of infant's head showing French catheter in place in trachea and insufflator attached ready for use. (Reprinted by permission of the Southern Medical Journal.)

agree that inflation of the lungs by oxygen or air is the most valuable measure to be taken in reviving the depressed infant. This is readily accomplished by use of the simple pocket insufflator illustrated herewith, developed at the University Hospital.¹⁰ This has a weighted valve which controls the pressure of air or oxygen to the lungs at 20 cm. of water pressure following latex catheter tracheal intubation under direct laryngoscopy. With the first insufflation of air blown into the lungs the fetal heart rate, which may have been 30 to 40 per minute, rises immediately to a rate double or triple. The color of the skin changes rapidly from bluish to pink, and in a few minutes to one hour or more of insufflation the infant breathes spontaneously, provided there is no fatal brain injury or severe diaphragmatic hernia, under which circumstances the infant may be kept alive only until insufflation ceases. We maintained one such alive with normal color and heart rate for eight hours. It may be that in the future some of these infants can be kept alive by insufflation

9. Potter, E. L., and Adair, F. L.: *Am. J. Obst. & Gynec.* **45**: 1054, 1943.

10. Volpitta, Perry P., and Torpin, Richard: *South. M. J.* **35**: 559 (June) 1942.

11. Schreiber, Frederic: *Apnea of Newborn and Associated Cerebral Injury*, *J. A. M. A.* **111**: 1263 (Oct. 1) 1938.

12. Yant, W. P.; Choinyak, John; Schlenk, H. H.; Patty, F. A., and Sayers, R. R.: *Studies in Asphyxia*, Public Health Bulletin 211, United States Treasury Department, Public Health Service, 1934.

13. Courville, C. B.: *Untoward Effects of Nitrous Oxide Anesthesia with Particular Reference to Residual Neurologic and Psychiatric Manifestations*, Mountain View, Calif., Pacific Press Publishing Association, 1939.

14. Horner, D. A.: *Surg., Gynec. & Obst.* **44**: 194 (Feb.) 1927.

of pelvis, size and presentation of the fetus. These measures, with proper sedation, are often prophylactic in preventing the tetanic contractions and especially the elevated tone between contractions. When high uterine tone prevails between labor contractions, the fetus is in danger because the normal heartlike action of the uterus in bringing maternal arterial blood to the placental area during the resting period and then squeezing it out through the veins during the contraction is abolished and the fetus then has access only to maternal blood depleted of oxygen. The measures cited, water, sugar and oxygen, plus more sedation for the mother, are the best preventive, and the prevention is much easier than the cure. In our studies the only drug effective in lowering the elevated uterine tone was morphine. Consequently, when the uterine contractions are of short duration, irregular in recurrence and accompanied with high uterine tone, morphine in a good dose ($\frac{1}{4}$ grain, or 0.016 Gm.) is most effective. Often the patient sleeps, it may be through the night, following which, refreshed, she goes into a more normal labor which progresses to spontaneous delivery or to full dilatation and with the presenting part low enough to deliver safely instrumentally.

In other instances, while the patient sleeps labor continues much more normally and the fetus is delivered in a few hours. In these cases special care must be taken to insufflate early if the fetus is depressed. If, as is too often done, the obstetrician attempts to stimulate the uterine contractions, disaster is invited. For the most effective way to throw a normal laboring uterus into tetany is by administration of oxytocics, pituitary injection and ergot preparations, and when these drugs are repeated the intrauterine contraction tone rises gradually with more oxytocic drugs until complete tetany, when 30 to 40 mg. of pressure is constant. All these have been demonstrated in the work of Woodbury and his co-workers² in our clinic.

In some cases of prolonged labor, progress seems to come to a standstill. In those cases, if the pelvis is adequate in size, vaginal delivery is still the best procedure, but only after complete dilatation of the cervix with the head at least in midpelvis. If no progress or increasing dilatation of the cervix is observed over a period of several hours, our studies showed that almost any cervix could be dilated without injury by a large Voorhees bag placed inside, displacing the presenting part above, and for that reason we have given up the use of Dührssen's incisions. A weight of 7 to 9 pounds may be attached to the bag and allowed to exert full weight only for forty seconds, followed by a resting period of two minutes simulating normal labor. This intermittent force certainly is more like nature's way and, in the few cases used, dilated the cervix without necrosis within a reasonable time, and a saving of several hours in this condition is practical. When the cervix is fully dilated, the head can be pressed into the midpelvis and readily and usually safely delivered by Kielland forceps. Douglas and Stander¹⁵ have recently shown that in prolonged labor the best results for the fetus follow spontaneous delivery.

ECLAMPSIA

As the immediate cause of eclampsia is not known, it is necessary to treat the condition symptomatically, and here, especially, good therapy to the mother is life saving to the fetus. Eclampsia is usually an acute

manifestation of more or less protracted toxemia and, while more common in young women, is more fatal to the older ones. The actual mode of death is most frequently asphyxia secondary to repeated convulsions. Next most often probably is pneumonia from aspiration of stomach contents taking place during a convulsion or while she is in coma. A few die from brain hemorrhage, which may occur during a convulsion. Some die from acute heart failure and a few from anuria. Others die in a condition similar to surgical shock, and it seems that this is more likely in the dehydrated patients.

The fetus usually, but not always by any means, successfully survives these violent attacks, and much more often if the mother's oxygen intake is augmented during convulsions and coma. If it survives, it seems not to be damaged by the experience. From this analysis it is evident that much can be done for these patients. Our five point treatment,¹⁶ developed in the management of 100 eclamptic patients, attempts to combat all possible causes of maternal and fetal death occurring during the attack or immediately thereafter; for, once the attack is weathered, the outlook brightens perceptibly:

1. Convulsions must be stopped. If they are severe, a sterile solution of phenobarbital sodium is given intravenously until controlled. Magnesium sulfate is used in addition for its possible effect in reducing the blood pressure, a gram an hour so long as the systolic pressure is above 160. Other barbiturates or paraldehyde may be used if necessary for sedation, but we do not use morphine because of its effect in increasing intracranial pressure and failure to control convulsions adequately.
2. Adequate salt free diet when the patient is not in coma.
3. Adequate fluid intake: 3,500 cc. of 5 per cent dextrose in sterile distilled water intravenously daily when the patient is in coma. Blood transfusions are indicated if anemia is present. Additional oxygen by oropharyngeal flow of 5 to 6 liters per minute is given constantly in severe cases. Both of these aid in carrying further oxygen to the fetus.
4. Absolute rest with elevation of the foot of the bed for lung drainage if the patient is in coma. For further prevention, constant suction aspiration with duodenal nasal tube may be employed.
5. Forestall recurrence of eclampsia by termination of pregnancy after recovery from the attack or when the condition becomes stationary by induction of labor, preferably by rupture of the membranes.

THIRD TRIMESTER HEMORRHAGE

Placenta previa and premature separation of the normally implanted placenta are serious complications of late pregnancy. By their very nature they are often associated with prematurity and, since the life of the mother is in ominous danger, hers should be saved at all costs. This does not excuse neglect of the fetus, which is fortunately benefited by good care to the mother. Such consists, in general, of measures to stop hemorrhage, to replace by transfusion her blood lost and to increase the concentration of oxygen. Hemorrhage is usually quite effectively controlled by rupture of the membranes and tight binding of the abdomen. We have given up cesarean section for almost all these cases except placenta previa centralis, which is very rare, only one having occurred in this series. By the routine immediate treatment of these cases all mothers should be saved and a much larger proportion of the infants than have been rescued in the past. Hospitals must become blood conscious and have available the various types for immediate use. Of course, the fetus.

15. Douglas, R. G., and Stander, H. J.: *Am. J. Obst. & Gynec.* 46:1 (June) 1943.

16. Torpin, Richard, and Coppedge, W. W.: *South. M. J.* 33:673 (July) 1940.

being premature as a rule, must have all the safeguards of that condition also, and, like other prematures, it stands vaginal delivery probably better than cesarean.

BREECH PRESENTATIONS AND MALPRESENTATIONS

As breech presentation carries a fetal mortality of at least 7 per cent (three and a half times that of cephalic presentation) in those cases in which the fetus weighs 5 pounds (2.3 Kg.) and a much higher mortality in prematures, every effort should be made to turn the fetus to cephalic presentation at the seventh or eighth month. Prophylactic external version is being accepted more and more as a sound procedure, and every physician doing obstetrics should be familiar with the technic, which has been well described in many papers of national distribution.¹⁷

When necessary to deliver a fetus by breech, x-ray examination of the inlet and of the fetus is invaluable, and in order to avoid damage as described it is wise to let the uterine and abdominal contractions furnish the force, and two hours of the second stage is not too long. The fetal heart tone should be recorded frequently. If the patient is unable to expel the fetus it is better to have some one push on the fundus through the abdominal wall than to pull on the fetus. If the arms are up, as is rarely the case, the shoulders should be rotated one at a time to the hollow of the sacrum and the arms delivered there. Episiotomy and forceps to the aftercoming head are highly recommended, and forceps should be used if the head does not deliver easily. Insufflation instruments should be at hand to oxygenate the baby's blood until it breathes spontaneously.

TRANSVERSE PRESENTATION

This malpresentation should be treated by prophylactic external version if seen prior to or early in labor. If first seen in labor, x-ray studies, inlet grid and soft tissue lateral films are most helpful, since most cases occur in the flaccid uterus of multiparas, often with twins. As a rule, vaginal delivery is best. If seen first in labor with full dilatation of the cervix and with adequate sized pelvis, internal version and extraction have been productive of no maternal mortality in a series of 24 cases, but the fetal mortality was 40 per cent.¹⁸ If seen in labor with undilated cervix and an adequate sized pelvis, a large Voorhees bag is inserted and intermittent weight applied. When the bag comes out, internal version and extraction are to be done if the fetus is alive. If the pelvic cavity is too small and the fetus is still alive, extraperitoneal section may be undertaken. If the fetus is dead, as is usual in neglected cases (in labor twenty-four hours or more), amputation of the head followed by delivery of the body by pulling on the prolapsed arm and then delivery of the head by fundal pressure with one hand and traction on the fetal jaw by the other are indicated.

GIANT FETUSES AND PREGNANCY PAST TERM

Obstetricians may fear past term pregnancies and the development of a giant fetus. For practical purposes this is extremely rare; in this series there was only one infant weighing more than 12 pounds (5.4 Kg.) at birth. The exceptional fetus weighed 14 pounds 7 ounces (6.55 Kg.) and was not able to be born vaginally. It was delivered by low cervical section and survived. How is the obstetrician to manage the preg-

nant patient who is apparently overdue? This is of great practical importance and probably accounts for many fetal deaths per year and not a few maternal mortalities from attempts to induce labor or from unnecessary cesarean operations. We have followed the rule that the patient should be allowed to go into labor spontaneously, at which time she is managed carefully by x-rays, fluids and sedation and a test of labor. Then there is no contraindication to cesarean section if one is necessary, which is extremely rare. Patients are instructed that labor may be normal and still be four weeks early or the same amount of time late. Furthermore; they are acquainted with the rule not to interfere, and these facts release any psychologic factor in the mind of the patient or physician. Once the obstetrician induces labor in one patient he is confronted with all her friends in like circumstances, for whom he finds arguments against a similar procedure difficult. Not that induced labor in itself is very dangerous; still, all in all, it is more so than spontaneous and should be reserved for definite indications. This attitude of non-intervention is dangerous only if the fetus is extra-uterine. The best time to determine this easily is in early pregnancy, from eight weeks to midterm, when every effort should be made by vaginal examination to determine the intrauterine presence of the fetus. The patients often have abdominal pains and quite often bleed or spot vaginally at times in pregnancy.

OTHER INJURIES

Most injuries to the fetus during labor are avoidable, especially breaking of arms and legs or overstretching of muscles and nerves of the neck. The obstetrician's responsibility, being practically double that of other types of medical or surgical care, should warrant the most careful appraisal of all factors in the mechanical procedure of difficult operative delivery. Consequently, none should be undertaken except after a careful x-ray study as outlined and, unless by an expert, this followed by manipulation of a fetal manikin placed in the identical position in relation to a model of a pelvis.¹⁹ From pictures in an anatomic atlas any local octogenarian who likes to whittle will readily make models of the three pelvic bones which may be assembled and attached to a solid base. A doll better than most in use can be made from cotton, covered with chamois skin, in the head of which are assembled the skull bones from a stillborn fetus.

By this method the operation of version and extraction is tremendously facilitated and even forceps operation is made much clearer. In regard to forceps operation, which is no doubt the commonest of all, most physicians feel quite competent. And yet many fetuses are temporarily and some permanently injured. Besides there is a rather high fetal mortality. The fetal mortality and morbidity are lowest if the indications and conditions are rigidly observed, including at least two hours of second stage labor. Observation of this will reduce the number of operations because many parturients will deliver spontaneously in the interim. The mastery of the forceps by manikin delivery of a fetal doll repeated daily for many days at a time, being sure to apply the blades exactly to the sides of the head in each case, can improve any one's technic. If given time and care enough, most will deliver spontaneously. The ideal forceps rate is low—

19. Satisfactory models for the individual physician can be fabricated by home talent.

17. Bartholomew, R. A.: *Am. J. Obst. & Gynec.* **14**: 648 (Nov.) 1927.
18. Torpin, Richard: *Am. J. Obst. & Gynec.* **39**: 92 (Jan.) 1940.

probably not over 2.5 or 3 per cent. In our hands the use of the Kielland forceps has been the easiest to teach, as this single type may be used in any case of low or mid forceps, and may be easily inserted so that the blades lie directly over the sides of the head. When rigid indications are followed a rather large percentage will be occiput posterior presenting heads which have become stationary in mid pelvis at occiput transverse. The Kielland forceps was developed with its bayonet blade for insertion underneath the symphysis pubis and the bladder for rotation onto the fetal head, so that its application is almost as simple as when the head lies on the perineum with its occiput anterior. I am of the opinion that Kielland forceps used properly, and this is easily learned on a manikin, is far less injurious to the fetus than any other type. In these 6,000 deliveries, there were 150 rather difficult forceps deliveries. Most of these were occiput transverse in midpelvis, and no fetus bore an external mark which showed the next day.

TECHNIC OF ACTUAL DELIVERY FOR PROTECTION OF THE FETUS

It goes without saying that the fetus should receive attention to the extent of recording the fetal heart rate during labor and delivery. How often depends somewhat on the attendants, but at least every half hour and especially so in the second stage. Variation in rate from time to time and especially slowing is indicative of hypoxia, and the treatment above all for this is, as a rule, oxygen to the mother and not rapid and often mutilating delivery.

The attendant frequently can diagnose early in labor the fact as to the cord, whether it is caught or free. He can do this by listening to the heart tones during a uterine contraction or between contractions but with firm pressure on the fundus. In either case, if there is no alteration in the fetal heart rate the cord is presumed to be free. If the rate slows and does not recover rapidly, the cord may be impinged on, and oxygen is indicated. Bourland²⁰ has recommended the Trendelenburg position for occult prolapse of the cord. Ideally the fetal heart rate should be observed constantly at actual delivery. This is readily accomplished by the anesthetist using a weighted fetal heart stethoscope as devised by Leff.²¹

At delivery of the head the cord, if wrapped round the neck, is loosened gently and slipped over the shoulders. Rarely is it necessary to cut it between clamps. It is imperative that the fetal head at all times be held low at delivery. Otherwise at the first inspiration mucous and vaginal secretions may be aspirated, which, in premature infants especially, may result in pneumonia a few days later. Even before the body is born it is wise also to suck out the secretions from the pharynx by aid of a rubber ear and ulcer syringe.

The delivery of the shoulders, which not infrequently causes delay, should be done by turning the body so that each shoulder in turn may be delivered in the hollow of the sacrum, as recently advocated by Woods.²² According to his technic, this cannot be done without synchronized pressure on the fundus and until the posterior shoulder has passed the ischial spines. Pulling the head is dangerous to the muscles of the neck and nerves of the brachial plexus. Rudolph²³ has described a technic by spiral movement and he states

that the shoulders should pass through the upper half of the pelvic cavity in an oblique manner. In the delivery of the series here reported we have used fundal expression without much traction on the neck, and the pediatricians report that they have seen no injuries of the arm or shoulder in any of the cases.

CARE OF THE PREMATURE FETUS

In regard to the premature fetus the confusion of the past is gradually giving way to the appreciation of the fact that premature infants are potentially quite as able to make good citizens as are full term infants. The studies of Hess,²⁴ Bundeson,²⁵ Studdiford,²⁶ Diddle and Plass²⁷ and many health departments, in addition to the truly marvelous work of Alan Dafoe in the management of the early lives of the Dionne quintuplets, have done much to educate not only the profession but the public as well in the appreciation of premature care.

Some things that have held back progress are:

1. Slowness of the general practitioner in realizing that the problem demands the utmost expert care.
2. Responsibility in the larger hospitals divided between obstetricians and pediatricians and, further, their failure often to require consultation of neurosurgeons.
3. The lack of interest taken by pathologists, as the cause of death frequently leaves few evidences to the examiner's eyes.
4. Scarcity of nurses well trained in this extremely specialized branch.

For the sake of argument, physicians should take the view that any infant weighing $2\frac{1}{2}$ pounds (1,134 Gm.) at birth should survive, and if it doesn't they should hold themselves responsible to ascertain exactly why it died and how to prevent repetition of the outcome in later cases. Occasionally one weighing $1\frac{1}{2}$ pounds (680 Gm.) at birth will live, but the mortality of those under 1,200 grams is 60 per cent, or more, according to Plass and Hess.

Of paramount importance is the part of the obstetrician in conduction of the delivery and the initiation of respiration with elimination of as many injurious facts as possible.

A few factors generally applicable to the delivery are as follows:

1. Induction of labor should be eliminated except for valid indications.
2. Prophylactic external version should be done if the head is not presenting.
3. What helps the mother is usually aid to the fetus; in three words, water, sugar and oxygen.
4. Sedation of labor takes preference over stimulation.
5. When the cervix has been fully dilated two hours, delivery is quite safe if done by deep episiotomy and either Kristellar expression or low forceps.
6. Conduct of delivery by cesarean section is not the answer to reduction of mortality of the premature fetus.
7. Vitamin K should be given.

During actual delivery there are several vital factors necessary to a successful outcome. First the forces acting on the fetal head are probably less dangerous if delivery is spontaneous than by forceps. If the uterine contractions in the second stage are too violent and too frequent with high uterine tone, there has been shown to be increased rate of brain injury to the fetus. This type of uterine contraction must be controlled by

24. Hess, Julius: *The Premature Infant*, Philadelphia, J. B. Lippincott Company, 1941.

25. Bundeson, H. N.: *Everybody's Health* 25: 215 (Dec.) 1935.

26. Studdiford, W. E., and Salter, H. P.: *Am. J. Obst. & Gynec.* 25: 215 (Feb.) 1938.

27. Diddle, A. W., and Plass, E. D.: *Am. J. Obst. & Gynec.* 44: 279 (Aug.) 1942.

20. Bourland, J. W.: *Am. J. Obst. & Gynec.* 31: 1043 (June) 1936.

21. Leff, M.: *Am. J. Obst. & Gynec.* 20: 108 (July) 1930.

22. Woods, C. E.: *Am. J. Obst. & Gynec.* 45: 796, 1943.

23. Rudolph, Louis: *Illinois M. J.* 69: 243 (March) 1936.

a general anesthetic, nitrous oxide or cyclopropane probably rating above ether or chloroform. If forceps are used their blades should be exactly over the sides of the head, and not too much pressure should be applied. The traction should simulate labor, forty second pulls relieved by one and one half to two minutes relaxation. The direction of traction is very important and easily learned on a doll through a pelvic manikin. The traction which is directed posteriorly at first follows a sharp curve upward as the head emerges. The pharynx must be cleansed of infected vaginal secretions, preferably by keeping the head low and by suction readily done by a rubber ear syringe. The infant must be kept warm and not traumatized and allowed to obtain all possible blood from the placenta. If the cry is not immediate, intratracheal insufflation is life saving if done with controlled pressure. All other methods are less effective and often injurious by trauma or infection, either of which is poorly withstood by the premature. Many premature infants survive for a few days only to succumb to a suddenly developing lung infection implanted by aspiration of vaginal secretions at its first inspiration. A full term well developed infant probably can eliminate aspirated material, but premature infants are often too weak to cough, and infection is often rapid and fatal and of such suddenness as to be mistaken for a fatal brain hemorrhage or congenital heart disease.

The umbilical cord ought to be ligated after pulsation ceases, during which time the mother should inhale oxygen so that some of it may enter the baby's blood through the cord. The baby, in addition, must not be allowed to get cold, and this is a prime duty of the obstetrician at the time of birth. The position of the infant should be head low in order to prevent aspiration. Oxygen is of value, but it cannot replace the careful prevention of aspiration of infected material. It goes without saying that gentleness is the keystone of success.

DIABETES MELLITUS

In the past ten or fifteen years, tremendous advance has been made in the care of pregnancy in women with diabetes mellitus, heart disease or tuberculosis, and most of this has been accomplished in special clinics for the pregnant women afflicted with one of these diseases, where the care is divided between the diabetes, heart or tuberculosis specialist in association with the obstetrician. Today the pregnancy is viewed as a complication of the disease instead of vice versa. In this manner not only the welfare of the mother has been enhanced but also that of the fetus, and no obstetric clinic should exist without having its diabetic, cardiac or tuberculosis patients cared for in a similar way.

The fetal death rate of this condition is high to such an extent that before the insulin era few live infants were born at term. The cause of death has not been entirely determined. Aside from a tendency to abortions, many fetuses die in utero near term; others have a tendency to development of excess weight while the skeletal structure and parenchymatous organs are underdeveloped. Some think this is due not to increased maternal blood sugar but to a pituitary factor. At any rate this complicates assurance of a live fetus. If it is allowed to remain in the uterus too long it may die, and, if delivered too early, it may succumb to the hazards of prematurity, even though its weight is above that of an average full term fetus.

White, Titus and Sisson²⁸ in Joslin's clinic, in collaboration with the Smiths, believe that the fetal mortality has to do with added toxic factors in the diabetic mother and they believe that this, in turn, is due to hormone imbalance, essentially an increase in the gonadotropic content of the blood, which results in lowering of the production or utilization of estrogen and progesterone. They advise substitution therapy by replacement of estrogen and progesterone in large doses. They advise the following labor therapy: vaginal delivery of those who show no toxemia or who have it controlled by substitution therapy, and cesarean section for those who develop toxemia.

Because of the tendency to development of large fetuses in diabetic women, extra studies by x-rays should be made, although the overgrowth is often not in the fetal skeleton. If the fundus measures 30 cm. above the symphysis pubis after eight months, there being no obvious hydramnios, it may be well to induce labor if the pelvis is adequate or perform cesarean section if it is contracted and the fetus is considered large. As soon as the infant is born it may develop hypoglycemia and should receive extra dextrose solution by mouth or otherwise. All infants with diabetic mothers should be treated as though they were premature.

PREGNANCY AND HEART DISEASE

In a study of 850 cardiac patients in pregnancy at the Boston Lying-in Hospital, Hamilton²⁹ and his co-workers have demonstrated the curve of the "load of pregnancy" and have shown that this begins to rise at the onset of the sixth calendar month and reaches its peak at the eighth month, declining from then on to full term. They divide pregnant cardiac patients into favorable and unfavorable. The favorable ones have enlargement of the heart and a murmur, while the unfavorable have, in addition, (1) evidence of or history of congestive heart failure, (2) presence of a dangerous disorder of the heart beat or (3) complicating serious disease.

If the patient belongs in the unfavorable group, she is advised to have her pregnancy terminated during the first five months. If seen later, she is carried to full term, when the load is less than during the sixth, seventh or eighth months. This not only lessens the mortality for the mother but saves many babies. Teel³⁰ and others have shown that premature infants of mothers with heart disease do poorly but that full term fetuses survive about as well as those born to healthy mothers. Students of pregnancy in heart disease agree that labor at the time of congestive heart failure is highly fatal and much of the improvement in care has been in preventing failure throughout pregnancy. During labor the fetus demands more consideration than it has received and, because of possible increased hypoxia, insufflation methods should be at hand to oxygenate the fetus until it breathes spontaneously. Continuous caudal analgesia should be the anesthesia of choice in these cases.

TUBERCULOSIS AND PREGNANCY

The tone of the papers on tuberculosis and pregnancy of ten years ago was much more pessimistic than those of today. The fetus has an improved chance because pregnancy is not so often terminated. Collapse therapy

28. White, Priscilla; Titus, R. S.; Joslin, P., and Hunt, Hazel: *Am. J. M. Sc.* **198**: 482 (Oct.) 1939.

29. Hamilton, Burton E.: *The Heart in Pregnancy and the Child-bearing Age*, Boston, Little, Brown & Company, 1941.

30. Teel, Harold M.: *Am. J. Obst. & Gynec.* **30**: 53 (July) 1935.

has benefited the pregnant patient as it has others. X-ray chest examinations at the beginning of pregnancy to diagnose tuberculosis early may some day rank with the Wassermann and Kahn tests for the early detection of syphilis. Pulmonary tuberculosis probably has little effect on labor, which should be conducted with minimum strain to the mother and with all safeguards for the fetus.

IMMEDIATE CARE OF THE NEWBORN IN RELATION TO NEONATAL MORTALITY

RALPH M. TYSON, M.D.

PHILADELPHIA

The success or failure of the immediate care of newborn babies in its relation to neonatal mortality poses a problem for both obstetricians and pediatricians. Neither specialty has too much of which to boast, for the continued high mortality during the first twenty-four hours after birth clearly indicates that the medical care given infants at that time is inadequate. In most cases this is due to factors existing before birth and, as a consequence, postnatal care no matter how adequate fails. There should be two objectives always in mind when dealing with the pregnant woman and later with her newborn child, namely (1) the elimination of possible difficulties developing during pregnancy, labor and delivery and (2) the prevention of emergencies arising in the postnatal period. Any apparent success that has been achieved in improving the survival rate by immediate treatment is in direct proportion to the extent that that care has been entrusted to the pediatrician. Further progress will depend on the intelligence, cooperation and zeal exhibited by both in approaching and participating in the solution of mutual problems.

In the effort to reduce neonatal mortality, the immediate care of newborn babies should concern itself particularly with those conditions causing the highest mortality such as (1) asphyxia, (2) infection, (3) hemorrhage, (4) feeding and (5) prematurity. It is recognized that all of these are somewhat interrelated with no sharp line of demarcation discernible and that, while at present these problems seem insurmountable, much is being accomplished by more efficient and complete antepartum care, skillful management of labor and delivery and more exact knowledge of the conditions dangerous to the infant in the early postnatal period.

ASPHYXIA

Little can be done to overcome severe asphyxia neonatorum apart from preventing the circumstances preceding birth which precipitate it. The causes and mechanism of its development are more clearly understood, but until the time when we can eliminate prematurity, complications of labor and delivery such as premature placental separation, placenta previa, cord dislocations, toxemia and defects or injury to the central nervous system we shall continue to acknowledge asphyxia as a most important factor in neonatal mortality. The increasing use of deep analgesia and anesthesia for delivery of infants has been accompanied by

a corresponding increase in the incidence of death from asphyxia. Perhaps it is the main reason why no decrease in the mortality of the first twenty-four hours has been achieved. One cannot expect a newborn infant to breathe spontaneously when its own blood is full of the anesthetic or analgesic administered to the mother and a relative state of anoxemia exists. The carbon dioxide content of the infant's blood may be high enough, but it fails to govern respirations in a normal physiologic way because of the presence of the hypnotic drug. This is particularly true in those cases in which some emergency complication of labor or delivery has occurred necessitating prompt surgical intervention and relatively deep anesthesia. When an analgesic has also been used prior to the emergency, added danger looms and the loss of blood, length of time consumed before delivery, prolonged anoxemia and shock in these cases account for a high mortality. The fact that most of the babies are premature makes the problem almost insurmountable from the standpoint of resuscitation and survival.

One of the early signs of fetal distress is a pronounced slowing of the fetal heart rate and convulsive activity of the baby during labor and should be recognized as an indication of anoxemia. If the heart rate should be increased beyond normal, subsequent severe asphyxia may be anticipated. Under such circumstances, inhalations of oxygen by the mother during the last several minutes of delivery and as long afterward as the cord pulsates will permit more oxygen and blood to reach the fetal circulation. Gentleness of manipulation and maintenance of body heat are two general principles of paramount importance in any resuscitation procedure followed from here on. It is recognized that a certain amount of shock is present in most newborn infants and, unless it is severe, these methods are all that is needed to help reestablish respirations.

After birth and even before the cord is severed, toilet of the mouth and pharynx should be instituted. Removal of anything which might obstruct fetal respirations, such as blood, mucus, amniotic fluid and debris, may be accomplished by postural drainage or aspiration. However, asphyxia associated with trauma of cerebral structures with gross hemorrhage and depression of the respiratory center will not respond to clearing of the air passageways alone. It is well to remember that permanent damage to the central nervous system, bringing about degenerative changes in nerve cells, may result from anoxemia associated with petechial hemorrhages and blood stasis; such damage is not reparable. Resuscitating machines are necessary to start and help maintain respirations during this emergency. Drugs such as nikethamide or alpha lobeline should be given but are often disappointing in their results as the effects are so often fleeting in character. Artificial respirations by some form of resuscitating apparatus should always be used although mouth to mouth insufflation is acceptable, but control of pressure is better secured by mechanical means. Of course, administration of oxygen should be continuous until spontaneous respirations occur and the color improves, at which time carbon dioxide in 6 to 10 per cent volume may be added to the oxygen at intervals. Tracheal catheterization may be necessary in severe cases of asphyxia, but this is a difficult procedure, especially since many

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babies showing asphyxia at birth are premature and structures are small and delicate.

An outline of the immediate treatment of asphyxia neonatorum includes (1) gentleness in handling, (2) warmth, (3) aspiration of mucus, (4) oxygen inhalations, (5) artificial respirations by mechanical devices, (6) carbon dioxide at intervals and (7) drugs which stimulate the respiratory center. Ultimate success will be achieved by preventive rather than by immediate postnatal treatment.

INFECTION

Accurate statistics on infection as a cause of neonatal mortality are difficult to secure. Much depends on whether an autopsy has been obtained and if microscopic and cultural studies were made at the same time. Our neonatal mortality survey in Philadelphia over several years showed that the mortality from infection was over 15 per cent when autopsies were performed but less than half that when not done. Types of infection usually found in the newborn vary and not all of them are fatal. Serious consideration must be given to each kind, however, for a seemingly minor disturbance may easily become a major disaster at any time. Pneumonia, sepsis, peritonitis and meningitis are generally fatal. Miliaria, impetigo, pyelonephritis, erysipelas, diarrhea and local skin abscesses can usually be controlled if appropriate measures are taken promptly.

Of all the organisms to which a newborn infant may be exposed, two stand out prominently, namely *Staphylococcus aureus hemolyticus* and *Escherichia coli*. These two organisms alone or in combination caused the largest percentage of pneumonia deaths in the Philadelphia survey referred to previously. It is rare to find either one causing pneumonia in later infancy or childhood, but it appears that the newborn infant has very little resistance to them whereas little susceptibility is apparent in the newborn to the ordinary catarrhal bacteria unless received in overwhelming doses at frequent intervals. The frequency and severity of staphylococcal infections in early infancy depends in large measure on whether they are saprophytic or pathogenic organisms and whether the antitoxin titer of the infant's blood is at an average level. It would appear as though some babies have a rapid fall in their antitoxic levels soon after birth and easily become a prey to the invading organisms. The almost universal presence of staphylococci on the skin, in the nose and throat and in the gastrointestinal tract may have some influence in gradually building up some resistance.

The prime objective of treatment of any infection of the newborn infant is in its prevention. This idea is so well recognized that ideal newborn nursery aseptic and antiseptic technics have been developed in many institutions where space and assistance are available. The one main criticism of these technics is that they are too extensive as a rule and also, one might say, exhausting to execute. The more exacting these regulations, the greater the opportunity for mistakes to occur. In summing up without going into too much detail, the generally accepted standard technics include (1) an intelligent, conscientious and permanent nursing staff with *esprit de corps*, (2) personal cleanliness of all nursery workers, particular attention being paid to the hair, hands, skin generally and clothing, (3) individual aseptic utensils for each child, thermometer, clothing and the like, (4) frequent washing of attendants' hands, especially after removing soiled diapers,

(5) exclusion of infectious individuals (local skin infections, upper respiratory infections and so on) from the nursery, (6) sterile milk room technic with use of sterile milk for all feedings, (7) competent feeding technics, gavage feedings only by trained nurses, (8) limiting persons allowed in the nursery to those with actual duties to perform and (9) avoidance of oil drops in the nose.

PNEUMONIA

In the Philadelphia study, pneumonia was responsible for 5 per cent of the total mortality without regard to whether or not autopsies were performed. Aspiration of foreign substances by the infant is probably the greatest factor in causing pneumonia, and it may result from insufflation of amniotic debris, vaginal secretion, milk directly or after regurgitation, nasal oil drops, by inhalations of bacteria laden air and as a terminal condition of sepsis. Massive pulmonary hemorrhages may arrest or impair circulation locally, thus furnishing a nidus for bacterial invasion later. Such hemorrhages may be a part of hemorrhagic disease, of asphyxia or of careless overexpansion of the lungs during resuscitation procedures. Pneumonia that follows atelectasis is perhaps in the same category as insufflation types. Treatment of pneumonia must be on the same basis as at any age. Aspiration of pharyngeal secretions and constant oxygen inhalation are prime necessities. The sulfonamide drugs have a definite place but have not proved of value in lipid types. The mortality is high, especially among the premature.

SEPSIS

Sepsis among newborn babies is probably more frequent than suspected. Many babies dying of pneumonia are perhaps in the terminal phase of septicemia and are classified as the former rather than the latter. Organisms gain entrance to the blood stream through abrasions of the skin, through the cord stump, through infected breasts, through gastrointestinal, pulmonary and genitourinary tracts and because of careless technics in intravenous and subcutaneous injections. The port of entry is not always found. In my own experience *Staphylococcus aureus* is the most frequent organism found, followed in importance by the colon bacillus, hemolytic streptococcus and *Streptococcus viridans*. Treatment is again one of prevention. Active therapy is not too successful unless localization occurs in some area that permits of drainage, such as the bone or kidneys. Transfusions of blood, plasma, dextrose, infusion of saline solution, sulfonamide compounds, careful feeding and treatment of local infection, if it occurs, are all of great value. Penicillin may prove invaluable.

SKIN INFECTIONS

Pyoderma is the most common form of skin infection seen in the newborn. Two forms are easily recognized: miliaria or heat rash, in which *Staphylococcus albus* is cultured from the pustules, and impetigo, characterized by cultures of *Staphylococcus aureus*. The skin of the newborn furnishes a vulnerable and fertile soil for the staphylococcus. Numerous attempts have been made to prevent pyodermic infections of the skin by alterations of bathing technic, antiseptic oils and ointments, but, regardless of procedure, lesions do appear and flourish. Overheating, brusque handling and rough clothing all tend to irritate the skin, thereby

opening minute ports of entry for the ubiquitous staphylococcus. The central point in the active treatment of pyoderma is to keep the area affected as dry as possible. Blebs and pustules should be opened, the contents wiped off with alcohol and a 5 per cent lotion of sulfathiazole applied freely. Exposure to ultraviolet radiation at a close distance is helpful.

DIARRHEA

Judging from reports now published in medical literature, diarrhea is more prevalent in epidemic form than formerly acknowledged unless previous epidemics have not been reported. It is hard to decide whether the condition is a disease entity in itself or a part of a symptom complex. In three such epidemics I myself have known, three different organisms were cultured from both the stools and the blood stream—*Streptococcus hemolyticus*, *Pseudomonas aeruginosa* (*Bacillus pyocyaneus*) and *Escherichia coli*. In one the streptococcus was cultured from the formulas, in another a pure culture of colon bacilli was obtained from gauze and cotton on the work table; the source of contamination by the pyocyaneus was never discovered. Undoubtedly, overfeeding with artificial food in the first few days of life is a contributory factor; indigestion may soon lead to severe diarrhea. Treatment of the condition is far from satisfactory and the mortality is high, while recurrences are common. Isolation of the infected babies, separation of the new infants, thorough cleaning and painting of the contaminated nursery and investigation of the nursing personnel regarding aseptic and antiseptic nursery technic are advisable procedures. Blood or plasma transfusions, adequate fluid intake, careful feeding preferably with diluted breast milk or skimmed lactic acid milk and the cautious use of sulfonamide drugs are indicated.

OTHER INFECTIONS OF LESS FREQUENCY

Erysipelas is a rare condition in the newborn, and in the past the mortality has been high. Today, however, sulfanilamide is practically a specific if given early and in appropriate doses, at least 1 grain per pound of body weight. Pyelitis is more frequent in male babies and may be associated with circumcision rites. It is a serious disease if due to *Staphylococcus aureus* and local kidney abscesses form. Urinary antiseptics, especially sulfathiazole in $\frac{1}{2}$ grain doses per pound and extra fluids generally yield good results. Meningitis is usually a fatal infection. Peritonitis is insidious in onset and usually is recognized too late for treatment to be of any avail.

INFANT FEEDING

It would not be necessary to stress the importance of breast feeding and judicious artificial feeding in neonatal mortality if it was not for the fact that the former is not emphasized enough, the latter is started too early and increases are made too rapidly. Mistakes in this field are not easily rectified and, even if they do not lead to death, they may so harm the infant that months are required to regain full health.

From the standpoint of the infant, preparation for breast feeding, both physical and psychologic, should be an integral part of good antepartum care. It is a sad commentary on our present civilization that most obstetricians as well as prospective mothers must be sold the idea. In many metropolitan centers, breast

milk stations have been established and flourish merely because many mothers refuse to nurse their babies and, when a situation arises (as so often happens) where the baby's life is at stake, they are eager and willing to buy expensive breast milk. Much can be accomplished by the obstetrician during the antepartum period in encouraging the proper mental attitude and preparing the breasts for their normal function. This can be started gradually, beginning about the fourth month of pregnancy, and should be carried out carefully and consistently until term, following definite procedures. The breasts should be washed twice daily with soap and water with a soft cloth. Later, as the nipples become accustomed, a rough cloth can be used, then changed to a soft brush and finally a hard brush. After each washing, the nipples and areolae should be anointed with hydrous wool fat. This will toughen the nipples without hardening them and prevent cracking and the occurrence of sore breasts when the baby starts to nurse. Such a program will instill in the mind of the expectant mother the desire to nurse her baby.

Granted that the proper preparation has been carried out during pregnancy, it should be a relatively simple matter to initiate this normal physiologic function after birth. It seems advisable that a rest period of six to twelve hours after delivery be given both mother and child. During the following twenty-four hours the baby should be put to the breast three times a day and allowed to nurse for three to five minutes on each breast. In the second twenty-four hours it should nurse four times daily and for five to ten minutes on each breast. From this time on the child should be nursed every four hours on one breast, twenty minutes at a time. During the first several days after birth there is some secretion of colostrum, which is thought to be important for the baby and perhaps is a means by which certain immune bodies are transmitted to it. A baby nursing vigorously at the breast will secure all the colostrum in the short period of time mentioned and will give the breast sufficient stimulation without traumatizing the tissues. There are some who believe that a three hour feeding interval is advisable, for in most instances the baby will secure more breast milk in seven feedings during the twenty-four hours than in six feedings. The four hour schedule, however, lends itself more readily to hospital routine.

A great deal of discussion has arisen over the initial weight loss of the child, and many efforts have been made to prevent this by giving complementary feedings. It is doubtful whether this initial weight loss is pathologic unless it exceeds 10 per cent of the birth weight and extends longer than four days. Complementary feedings should not be started before the end of the first week in the great majority of cases. A good many obstetricians, who also look after the infant, fail to recognize the principle involved and admit that they know nothing about infant feeding. During this trial period of two days it seems wise to give 5 per cent lactose solution, preferably by medicine dropper. The avoidance of rubber nipples in the baby's mouth will be a big help in the proper institution of breast feeding.

A good many of the objections to breast feeding are not valid ones and are the result of selfishness on the part of the mother. One need not discuss the increased resistance to disease with a lowered mortality and morbidity that occurs when a baby is breast fed. Artificial

enhance the chances of survival in most cases. Errors in judgment or failures in technic are not easily overcome in the newborn, and every effort should be made to give these babies the benefit of the combined knowledge of each specialty. Success or failure can ensue, depending on our ability to recognize danger signals, our resourcefulness in combating them and patience in dealing with the complexities encountered.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. POTTER, SAGE, TORPIN AND TYSON

DR. STEWART H. CLIFFORD, Boston: Dr. Torpin's thesis that an adequately controlled test of labor will reduce operative delivery and thus benefit the fetus is fundamentally sound. The importance of x-ray pelvimetry prior to labor and x-ray observations on the progress of labor in certain situations cannot be overemphasized. In time the x-ray control of abnormal labor may well be as required a procedure as the use of the x-rays in the treatment of fractures. Asphyxia is certainly a most important cause of live born infant death—Potter and Adair found it responsible for 40 per cent and we at the Boston Lying-in Hospital have found it the cause of 58 per cent of our live born infant deaths. The treatment of fetal anoxia through the administration of 100 per cent oxygen to the mother would seem to be a sound physiologic procedure, provided the placental cord circulation is functioning. I should like to ask if there is not a danger of reaching an explosive concentration of gas if straight oxygen is given a mother under cyclopropane or ethylene anesthesia. I believe that nitrous oxide anesthesia adds to fetal anoxia, and it is now seldom used at the Boston Lying-in Hospital. Morphine likewise is seldom used because of its depressant effect on the infant's respiratory center. The safest way to deliver a premature infant from below is without the use of any general anesthesia or analgesia. Delaying the normal delivery of the fetal head by pressure on the perineum should be mentioned to be bitterly condemned—it may cause the most severe fetal damage through asphyxia. On only one point do I take strong issue with Dr. Torpin, and that is with regard to direct laryngoscopy and intratracheal insufflation of oxygen. The procedure is not without risk even in the most highly trained hands. Dr. Torpin states that in his series of 6,000 deliveries "1 in 10 or 15 newborn infants needs insufflation." This means that 400 to 600 babies in his series were thought to require direct laryngoscopy and tracheal intubation. For a good many years the neonatal mortality at the Boston Lying-in Hospital has been around 15 per thousand live births, and our deliveries have run around 4,000 per year. With all this experience we have as yet not found it necessary or advisable to adopt the method of resuscitation advised by Dr. Torpin. We rely on clearing the air passages by postural drainage and suction followed by a closed method of administering oxygen under controlled pressure. Dr. Tyson has made the important point that the high infant mortality of the first twenty-four hours of life cannot be charged to a failure in pediatric care, since in most cases it is due to factors operating prior to or during labor. The deaths in the first twenty-four hours may properly be considered an obstetric responsibility. The deaths occurring beyond this period from conditions that became operative after birth may well be considered a pediatric responsibility. Material reduction in the largest group of neonatal deaths, occurring in the first twenty-four hours, can be achieved only along obstetric lines of approach: material reduction in the later neonatal deaths may well be the result of pediatric studies. In this field the obstetrician and the pediatrician must work together that the specialized knowledge of each may benefit the newborn infant. At the Boston Lying-in Hospital the extensive use of analgesia and anesthesia has been accompanied by neither an increased stillbirth rate nor an increased incidence of death from asphyxia. However, in the case of premature labor the best results may be anticipated if such medication is not used. We are encountering various degrees of acute hemolytic anemia of the newborn with increasing frequency. In the

light of present knowledge concerning the etiologic role of the Rh factor in this condition, the older terminology of erythroblastosis fetalis of the congenital hydrops, icterus gravis and congenital anemia types might well be abandoned. Every mother in our clinic is now having her Rh type determined in the antepartum clinic. If the mother is of the Rh negative type, a definite Rh negative donor is found for her in case a transfusion should become necessary. If the mother is Rh negative her husband is tested, and if he is Rh positive her blood is watched throughout her second and subsequent pregnancies for the appearance of anti Rh agglutinins. If the primiparous Rh negative mother gives a history of having had a transfusion in the past, her blood is watched through pregnancy for the appearance of anti Rh agglutinins. As a result of this routine the hemolytic anemias of the newborn may be anticipated and treated soon after birth. All transfusions given to infants suffering from acute hemolytic anemia are from compatible Rh negative donors—never from the mother.

DR. RUPERT E. ARNELL, New Orleans: By the most conservative estimates at least half of the neonatal deaths are preventable. They do not occur when adequate care is available. Without consideration of the economic, social and educational problems involved, responsibility for reducing neonatal mortality ultimately must rest with the medical profession. Prophylaxis begins ideally with premarital and preconceptional examinations and is followed in a broad, continuous program by adequate, intelligent care and supervision during pregnancy, parturition and after delivery. Preventive measures during pregnancy and labor produce double rewards in that two lives are preserved. Possibly certain problems dealing with the cause and prevention of premature labor have received insufficient attention. Promiscuous induction of labor for convenience should be condemned. Increased medical knowledge and improvements in therapy reduce the incidence of premature labor, spontaneous and induced, in many constitutional disorders and physical abnormalities. In this respect, diet and nutrition have assumed a sphere of major importance. In a recent dietary survey of a large group of private patients as well as white and Negro charity patients dietary defects and deficiencies were found with startling frequency. Dangerously low intakes of protein, vitamins and minerals were discovered in 30 per cent of the Negro, 20 per cent of the white charity and 10 per cent of the private patients. The fetal mortality in this group was approximately eight times greater than in the good diet group. Neonatal death due to birth injury occurs most frequently following prolonged labor and difficult operative delivery. In untrained hands catastrophe is almost inevitable. The necessity for many of these extensive and dangerous procedures can be obviated by the judicious application of a trial of labor combined with careful roentgenologic studies. There is wide divergence of opinion regarding criteria for test of labor and trial of labor, particularly the length of labor. The criteria suggested by Dr. Torpin for test of labor are valid for normal patients but are too inflexible and somewhat strict for abnormal ones. Careful individualization is necessary, modifying criteria when indicated. No one questions the value of x-ray examination in obstetrics, but too much reliance is placed on the prognostic accuracy of pelvcephalography. Clinicians of wide experience seldom require roentgenograms to determine the presence of disproportion in labor. Not infrequently, information of greater value is provided by a careful vaginal examination. At the Charity Hospital in New Orleans elective cesarean section is reserved for cases with obvious indications, whereas questionable dystocias are permitted trial of labor, ranging from one to twenty-four hours. In the five year period ended July 1, 1943 there were 28,066 deliveries with 466 cesarean sections, an incidence of 1.66 per cent. Many instruments and machines have been invented and various technics have been advocated for the treatment of asphyxia and apnea neonatorum. Resuscitation after delivery has been made needlessly complicated. Any physician, after an hour's instruction, can become adept in the use of a tracheal catheter and will find this simple, safe and cheap technic more effective than complicated methods. No delivery should be conducted, in the hospital or the home, without ready access to several tracheal catheters of different sizes.

In the absence of contraindications, breast feeding should be almost mandatory. Pursuing a program similar to that suggested by Dr. Tyson, we were able in one of the well baby clinics of the New Orleans Health Department to increase the incidence of breast feeding from 30 per cent to 90 per cent within a period of six months.

DR. KATHARINE K. MERRITT, New York: Pediatricians will welcome Dr. Tyson's statement that their chief object is the "prevention of emergencies arising in the postnatal period." There will be some disagreement with his statement that resuscitating machines are necessary to start and maintain respirations when asphyxia is present. At the Sloane Hospital for Women only the Flagg apparatus is used, and that only rarely. Nikethamide and alpha lobeline are used rarely. After blebs and pustules are opened, 95 per cent alcohol is applied and heat is used to keep the affected areas as dry as possible. Sulfathiazole in vanishing cream is applied to the lesions. Dr. Tyson will have much support in his belief that many newborn infants fail to get an adequate breast milk supply, because of the too prevalent habit of giving complementary feedings before the end of the first week; he feels rightly that obstetricians and pediatricians should not be alarmed at an initial weight loss which does not exceed 10 per cent of the birth weight and that "crying and hunger" should not cause consternation. In giving the figures for "hemorrhagic conditions" a definition of terms should be made. If retinal hemorrhages are included, the incidence will surely be greater than 1 per cent. In accordance with the policy of prevention rather than cure, vitamin K is routinely given into the mother's vein in the delivery room at the Sloane Hospital for Women, except when the caput is in sight on admission. In that event the infant is given vitamin K intramuscularly. Dr. Tyson stresses the importance of the prevention of prematurity and the presence of a skilled nursing staff. I agree with Blackfan and Yaglou that it is better to let the smallest premature infants stabilize their temperature at a degree or two below the accepted "normal" rather than risk hyperpyrexia by trying to force the level up. The use of carbon dioxide with oxygen has been abandoned in some newborn services, since Eastman has demonstrated its lack of rationale. Instead of "alterations of bathing technic" in an effort to reduce skin infections, the Sloane Hospital for Women has abandoned bathing altogether. The infant's skin is not touched at all, except to wash off blood from the scalp and face right after birth and to apply oil in the neonatal period if the infant's skin is very dry and cracked. It is also felt that too much cleansing of the upper respiratory tract immediately after birth may abrade the mucous membrane, thereby creating a port of entry for bacteria.

DR. JOHN PARKS, Washington, D. C.: Dr. Torpin and Dr. Sage indicate the dangers in breech presentations. As long as the cord pulsates, the infant receives oxygen. Injuries and asphyxia in breech deliveries are more often avoided by a finger on the cord than by an eye on the clock. Cesarean section solely for saving the infant is frequently unsuccessful. Cesarean section is as much an operative delivery for the infant as it is for the mother. In prolonged rupture of the membranes, the infant's chances of infection in utero may be reduced by administering sulfonamides to the mother. Maternal metabolism and adequate diet influence fetal development. Dr. Tyson's excellent summary on breast feeding is of timely importance. Twelve per cent of the live births at Gallinger Municipal Hospital in the last five years were premature. Two thirds of all fetal deaths occurred in premature infants. In 1,202 patients with toxemia of pregnancy, 18.2 per cent of the infants were premature. In 254 patients with premature separation or abnormal implantation of the placenta, 58 per cent of the infants were premature. One or both infants weighed less than 5 pounds 8 ounces (2.5 Kg.) in 77.5 per cent of 116 twin pregnancies. Many patients who had premature infants gave histories of intercourse occurring less than forty-eight hours before rupture of membranes or the onset of labor. Syphilis, congenital malformations and acute systemic diseases were lesser contributory factors. Since the majority of obstetric complications have a

more profound effect on the fetus than on the mother, infant mortality is a more delicate index of good obstetrics than is maternal mortality. I agree with Dr. Potter that "if a sufficient number of people have a great enough desire" neonatal mortality can be reduced in the nation as remarkably as it has been in Chicago.

DR. EARL C. SAGE, Omaha: The causes of neonatal mortality in their order of importance are (1) prematurity, (2) birth trauma, (3) asphyxia and (4) infection, which assumes a minor role. I agree with Dr. Torpin on the value of x-ray pelvimetry in the antepartum period and during the early stage of labor, although we must recognize that the majority of babies are delivered by general practitioners under circumstances which preclude the use of the x-rays. Without minimizing the services of the obstetrician, one should not overlook the fact that improvement in nursing care would tend materially to reduce the neonatal death rate, especially among premature infants. Too many nurseries are understaffed, and even more of them often rely on insufficiently trained student nurses under inadequate supervision. What small gain has been made in our neonatal record has come principally from the larger maternity hospitals or teaching hospitals where obstetricians and pediatricians have pooled their knowledge to their mutual advantage and for the benefit of the infants. In Nebraska at large, following several years of outstate refresher courses in obstetrics and gynecology, there has been a decrease in the numbers of babies who died shortly after birth from 1,331 in 1930 to 764 in 1941. It is justifiable to attribute this improvement to a better understanding by the general practitioner of the mechanism of labor and neonatal physiology. Large scale improvement in the death rate among newborn babies will come with better obstetric and pediatric skill acquired by the rank and file of medical practitioners. The issue is primarily educational. We may look forward to the time when the blood of each mother who had an unexplained stillbirth or neonatal death is examined for the presence of the anti Rh or other atypical agglutinins. Schwartz and Levine have shown that in cases of intrauterine death occurring well in advance of labor, as evidenced by fetal maceration, the incidence of erythroblastosis is somewhere between 16 and 29 per cent. Most cases of prematurity appear unrelated to the Rh factor. Efforts to reduce neonatal mortality further must be directed toward conditions associated particularly with early infancy (prematurity), birth injuries and congenital malformations as well as maternal illness.

DR. RALPH M. TYSON, Philadelphia: Careful supervision of the nutrition of the mother during pregnancy has much to do with securing a healthy baby. The symposium fails to stress sufficiently the importance this phase of antepartum care has in relation to the prevention of neonatal mortality. Too often mothers disregard the dietary regimen advised by their obstetricians, either through thoughtlessness or because the physician has not impressed fully on the patient the necessity for conscientious adherence to the diet. Dr. Torpin's suggestion that oxygen be given to the mother during emergency operative procedures should be of inestimable value in preventing anoxemia in the fetus. More emphasis could be placed on a closer study of the fetal heart rate during labor and delivery in order that the first signs of anoxia might be detected. It was interesting to note that various methods of delivery are successful when placenta previa complicates the situation. The prevention of prematurity was not stressed enough. It is not generally appreciated what an important part the position of the capillary bed in the air vesicles of the lungs of premature infants has to do with their survival. If oxygen cannot be gotten into the blood stream of the child through the lungs, not much success will be had in saving that particular infant. Hemorrhage and hemorrhagic disease in the newborn must be clearly differentiated. The former almost always is due to an injury in which the continuity of some organ or part of the body is broken and occurs more frequently than the latter condition, which usually refers to some form of blood dyscrasia, either hemorrhagic disease of the newborn or an acute hemolytic anemia. Dr. Clifford's insistence on the selection of a proper donor (negative Rh) in cases of erythroblastosis is timely.

METABOLIC STUDIES ON PATIENTS
WITH CANCER OF THE GASTRO-
INTESTINAL TRACT

XIV. THE EFFECTS OF HIGH PROTEIN DIETS ON
THE PREVENTION OF POSTOPERATIVE HYPO-
PROTEINEMIA IN PATIENTS WITH
GASTRIC CANCER

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Recent investigations here and elsewhere have demon-
strated that a pronounced negative nitrogen balance
occurs in patients after intra-abdominal operation.¹ In
most instances this nitrogen loss does not seriously
affect the concentration of protein in the serum, but
in patients with gastrointestinal cancer the development
of significant hypoproteinemia is an almost uniform
finding.² The gravity of postoperative hypoproteinemia

period elapses before he again can receive a normal
protein intake. Although it is possible by frequent
plasma and blood transfusions to maintain normal con-
centrations of plasma proteins in these patients, this
method in many instances becomes unfeasible.³ Hence
it appeared desirable to ascertain whether or not the
preoperative administration of very high protein diets
could prevent the usual postoperative hypoproteinemia.

CLINICAL MATERIAL AND METHODS

The present study was made in a group of 6 patients
with carcinoma of the stomach who were fed diets of
from 41 to 47 calories per kilogram daily in three equal
meals. These diets contained from 101 to 196 Gm. of
protein (2.18 to 2.68 Gm. per kilogram of body
weight). In all the patients the carcinoma was found
at laparotomy to involve the upper segment of the
stomach and hence to be inoperable.

The methods for the complete collections of stool and
urine have been described in a previous communication.⁷
Nitrogen was analyzed in the food, stool and urine by a
Kjeldahl technic, and serum albumin and globulin were
measured by the method of Robinson, Price and Hog-
den.⁸ Plasma volumes were measured by the method of
Gregersen and Stewart.⁹

Effects of the Oral Administration of Large Amounts of

Patient	Period	Daily Average Calories per Kg.	Intake of Protein, Gm. per Kg.	Days	Average Nitrogen Balance, Gm. per Day	Concentration at On-set of Period of Serum			Concentration at End of Period of Serum		
						Protein, Gm. per 100 Cc.	Albumin, Gm. per 100 Cc.	Globulin, Gm. per 100 Cc.	Protein, Gm. per 100 Cc.	Albumin, Gm. per 100 Cc.	Globulin, Gm. per 100 Cc.
G. C.	Preoperative.....	42	2.16	17	+17.1	7.2	3.6	3.6	7.8	3.8	4.0
	Postoperative.....	7.5	0.41	3	-4.6	7.8	3.8	4.0	7.5	3.5	4.0
B. P.	Preoperative.....	41	2.68	22	+12.15	6.4	4.2	2.2	7.2	5.0	2.2
	Postoperative.....	13	0.25	8	-9.4	7.2	5.0	2.2	6.9	5.0	1.9
R. M.	Preoperative.....	41	2.16	18	-11.45	6.5	3.7	2.6	6.8	4.7	2.1
	Postoperative.....	10.5	0.31	9	-4.8	6.8	4.7	2.1	6.1	4.0	2.1
R. S.	Preoperative.....	47	2.56	10	-9.3	5.6	4.1	1.5	6.5	4.5	2.0
	Postoperative.....	25	0.51	11	-1.2	6.5	4.5	2.0	6.1	3.8	2.3
J. C.	Preoperative.....	45	2.56	20	-18.5	5.85	4.0	1.95	6.95	4.1	2.85
	Postoperative.....	13	0.62	12	-5.4	6.95	4.1	2.85	6.2	4.4	1.8
P. T.	Preoperative.....	32	2.18	18	+8.2	6.2	3.8	2.4	7.0	3.1	1.9

is widely recognized, and any measures which would
successfully prevent its occurrence should prove most
useful.

The development of postoperative hypoproteinemia
in the patients with gastrointestinal cancer apparently is
the result of numerous factors. Among these are that
(a) frequently the patient is already hypoproteinemic
when he comes to surgery, a fact which strongly sug-
gests that his protein stores are depleted;³ (b) the
functional capacity of his liver is very much impaired,⁴
and therefore the fabrication of plasma albumin by this
organ is likely to be limited;⁵ (c) after a resection of
some portion of the alimentary tract a necessarily long

RESULTS

As previously stated, patients with gastrointestinal
cancer usually have low serum protein levels before
operation, an observation which would indicate that
their protein stores already are considerably depleted.³
Hence it was reasonable to assume that if these stores
could be reestablished preoperatively the patient might
better sustain the unavoidable nitrogen loss after
operation and not develop a serious degree of hypo-
proteinemia.

To accomplish this purpose, 6 patients with gastric
cancer were fed diets which contained from 41 to 47
calories and from 2.18 to 2.68 Gm. of protein per kilo-
gram of body weight. When the feeding of these diets
was begun, the serum protein levels of 5 of these 6 per-
sons were abnormally low, and in 4 the low values were
due chiefly to decreased concentrations of albumin.

After the diets were fed for from ten to twenty-two
days and the patients had retained from 51.2 to 115.5

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Gm. of protein per day, the concentrations of albumin increased in all by from 0.2 to 1.3 Gm. per hundred cubic centimeters and the total circulating albumin by from 10 to 37 Gm., as shown in the table. The concentrations of globulin increased in only 3 persons by from 0.4 to 0.9 Gm. per hundred cubic centimeters; in 1 this fraction remained unchanged and in 2 decreased by 0.5 Gm. per hundred cubic centimeters. In all, however, because of the rise in plasma volumes, the total circulating globulin increased by from 3 to 34 Gm. The net effect of these changes was that at the time of operation none of the 6 patients were hypoproteinemic. It is interesting to note, however, that of the total amounts of protein retained (from 580 to 2,310 Gm.) only from 0.55 to 3.5 per cent could be accounted for by the formation of serum albumin and from 0.3 to 1.8 per cent by the formation of serum globulin. All the rest apparently was diverted to the formation of tissue protein.

In a previous study² in which the concentrations of protein in the serum of 36 patients with gastric cancer were measured both on the day of operation and during the next five days, the average decrease of these levels was 0.63 Gm. per hundred cubic centimeters. During

operative negative nitrogen balance and fall in the concentration and total amount of circulating protein, none of the patients developed a significant degree of hypoproteinemia. This maintenance of relatively normal concentrations of serum protein probably is due to (a) alterations of plasma volume and (b) the fact that in 4 of the 5 patients the amounts of circulating protein lost after operation are about equal to the amounts fabricated in the period of nitrogen retention. In the fifth patient the plasma protein loss after operation was five times that formed in the preceding period. It is interesting to note that, although only from 1.47 to 3.8 per cent of the retained protein had been diverted to the formation of circulating proteins, the decrease of this protein fraction accounted for from 13.6 to 44.6 per cent of the nitrogen loss after operation.

COMMENT

From the evidence presented it would appear that the ingestion of large amounts of protein significantly increased the formation of circulating albumin and globulin. Since only about from 3 to 5 per cent of body protein is that in the plasma, it is not remarkable that only about 3 per cent of the retained nitrogen is

Protein on the Metabolism of Nitrogen in Patients with Gastric Cancer

Plasma Volume at		Total Amount at Onset of Period, of Serum			Total Amount at End of Period, of Serum			Per Cent of Retained Protein Diverted to Formation of Serum		Per Cent of Nitrogen Lost Derived from Serum	
Onset of Period, Cc.	End of Period, Cc.	Protein, Gm.	Albumin, Gm.	Globulin, Gm.	Protein, Gm.	Albumin, Gm.	Globulin, Gm.	Albumin	Globulin	Albumin	Globulin
4,450	4,450	320	160	160	360	170	190	0.55	1.65		
4,450	3,950	360	190	190	321	145	176	....	....	28.6	16.0
2,250	2,600	173	119	54	223	156	67	2.75	0.75		
2,600	2,325	223	156	67	169.5	116.5	44	....	....	8.7	4.9
3,130	3,260	192	132	60	210.5	142	68.5	0.82	0.65		
3,260	1,860	210.5	142	68.5	113	74	39	....	....	25.4	11.0
1,820	1,900	102.5	75	27.5	124	86	38	1.0	1.8		
1,900	1,700	124	86	38	103	64	39	....	....	3.0	0
1,870	2,540	103.5	72.5	36	170	100	70	1.2	1.4		
2,540	1,755	170	100	20	109	77	32	....	....	5.7	9.3
2,400	2,780	160	110	50	195	142	53	3.5	0.3		

this immediate postoperative period 67 per cent of the patients had levels below 6.1 and 41 per cent below 5.6 Gm. per hundred cubic centimeters.

In contrast to these results were the findings in the patients included in the present investigation. Five of these were followed after operation. Although all were in negative nitrogen balance for from three to fourteen days postoperatively by from 1.2 to 9.4 Gm. per day, none developed protein concentrations below 6.1 Gm. per hundred cubic centimeters. The average decrease in the concentration of serum protein was 0.49 Gm. per hundred cubic centimeters. In 3 instances the concentrations of albumin decreased from 0.3 to 0.75 Gm., in 1 it remained unchanged and in 1 it increased 0.3 Gm. per hundred cubic centimeters. In all the total albumin diminished by from 22 to 68 Gm. In 2 patients the concentrations of globulin fell by 0.30 to 1.05 Gm., in 2 it remained constant and in 1 it rose by 0.3 Gm. per hundred cubic centimeters; in 3 the total circulating globulin decreased by from 14 to 29.5 Gm., in 1 it remained relatively unchanged and in 1 it increased 12 Gm.

From these results it would appear that the preoperative oral administration of large amounts of protein could induce a considerable nitrogen retention and remission of hypoproteinemia. In spite of the post-

diverted to plasma protein formation. This relatively small diversion has been observed also in hypoproteinemic dogs.¹⁰ A reduced protein concentration in the plasma, therefore, probably is only a peripheral phase of a general depletion, and the administration merely of 1 or 2 liters of plasma to the hypoproteinemic patient during his postoperative period of negative nitrogen balance cannot be expected to increase significantly his concentration or total amount of serum protein. Although nitrogen balance frequently may be attained postoperatively by the administration of considerable amounts of blood, plasma and amino acids, this technic is not always feasible. The safer course, probably, is to establish preoperatively adequate protein stores which can be drawn on by the patient after operation. By this last means the present investigation demonstrates that at the end of the periods of negative nitrogen balance the concentrations of protein in the serum of the patients studied in no instance fell below 6.1 Gm. per hundred cubic centimeters. At this level the consequences of hypoproteinemia are decidedly remote. In contrast to this finding was the fact that in another group of 36 patients with gastric cancer who were fed preoperatively

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only the usual hospital diets the concentrations of serum protein in 10 instances fell during the first five days after operation to less than 5.6 Gm. per hundred cubic centimeters, a level at which the complications of hypoproteinemia frequently develop.

CONCLUSION

By the preoperative ingestion of considerable amounts of protein for from ten to twenty-two days, serious degrees of hypoproteinemia can be prevented in patients with gastric cancer during their postoperative periods of negative nitrogen balance.

Clinical Notes, Suggestions and New Instruments

PENICILLIN IN GAS GANGRENE

REPORT OF A SUCCESSFULLY TREATED CASE

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In their recent cooperative study on penicillin in the treatment of 500 infections, Keefer and his associates¹ stated that "experimentally it is a potent agent in gas bacillus infections, but up to the present time there are no studies on human cases." The comparatively rare occurrence of this important war infection in civilian life determines us to report a preliminary contribution. We observed a severe gas infection in a 7 year old girl. After all routine measures, including serums, sulfonamides and amputation, had failed, Dr. Chester Keefer² provided us with penicillin in sufficient quantities to treat successfully the patient, whose outlook seemed hopeless. The isolation of our mountain hospital made it unprepared and unequipped to furnish exhaustive laboratory studies. The clinical significance of our observation, however, remains important enough to justify more investigations of this treatment.

REPORT OF CASE

Y. T., a girl aged 7 years, of normal development, who had an uncontributory history of the common childhood diseases, on Aug. 15, 1943 was found late in the evening lying on the porch of her home with a fractured left forearm. How she had fallen or how long she had been lying on the dry wood floor could not be ascertained. When first seen she was immediately transferred to the hospital. In the middle of the left forearm at the medial side was a bleeding puncture wound, which was sprinkled with sulfathiazole powder and sterile dressed. The arm was immobilized on a splint. Tetanus antitoxin 1,500 units was injected. X-ray examination showed angulation of the proximal ulnar fragment; the radius was intact. On the following morning there was no fever, but the child complained of slight pain. Under ether anesthesia the ulna was reduced before the fluoroscope and a cast was applied. On the third day, the patient was very restless, incessantly crying for her mother. The temperature was 98 F., the pulse rate 94. A slight discoloration of the hand was attributed to the cast, which was cut open and removed. The next morning the temperature rose suddenly to 102 F., the pulse rate to 140; the whole left forearm showed a deeply livid discoloration. No pulsation was felt in the left hand, no movements of the fingers were possible, and the muscles presented emphysematous vesicular crepitation when palpated. The no longer doubtful diagnosis of gas gangrene could be

confirmed by multiple air bubbles along the muscle sheaths in x-ray films of the left forearm. Immediately 20,000 units of gas antitoxin was injected intravenously, sulfathiazole 3 Gm. was given by mouth, broad length incisions through the left hand and forearm were irrigated with peroxide, sulfathiazole crystals were topically applied, and high voltage x-rays were given.

On August 19 the twice repeated antitoxin injections (40,000 units) and the continued sulfonamide medication did not prevent the progress of the infection to the upper left arm and axilla, as x-ray examination clearly showed. Leukocytes numbered 17,300 and hemoglobin was 80 per cent. On August 20 the continuous high temperature of 102 F., pulse rate 126 and the ill smelling mummification of the entire left arm made a further postponement of an operation impossible. Under ether anesthesia a high amputation of the left arm was performed (Dr. W. B. McKnight). During the night the patient was delirious and temporarily semicomatose. Blood plasma was given. For several days after the amputation air bubbled from the edematous axilla wound during the dressing. On the seventh day, August 22, shortly after midnight, the shipment of penicillin arrived. Immediately 20,000 units in isotonic solution of sodium chloride was given intravenously, followed by 40,000 units as a continuous drip. The temperature rose to 104 F. and leukocytes numbered 35,000. For the next three days a continuous intravenous drip was maintained with short intervals for rest. In addition 20,000 units was twice injected intramuscularly into the stump; altogether 240,000 units was given. On August 25 the penicillin drip had to be discontinued because of the general edematous condition of the patient. The puffed-up eyelids could hardly be opened. The temperature was 101 F., hemoglobin 55 per cent, erythrocytes 1.6 million, leukocytes 29,000. A lack of donors made a planned blood transfusion impossible. The general condition and the intake of food appeared improved. It was noteworthy how little the loss of her arm seemed to affect the patient, who was mentally far ahead of her 7 years and showed an unusual degree of cooperation. Tissue specimens were sent for bacteriologic examination to the Department of Public Health in Berkeley and to the laboratory of Dr. Lawrence Parsons in Reno. At this time it was not possible to identify the specific strain of the gas bacillus group. The patient was seen at the height of the infection by four experienced clinicians who had not the slightest doubt about the diagnosis so clearly demonstrated in the x-ray films. During the ensuing week the temperature gradually dropped below 100 F. and the wound cleaned up. On September 6 the erythrocytes had increased to 3.2 millions and the hemoglobin to 85 per cent; the leukocytes had dropped to 4,800. Under antianemic and symptomatic treatment the patient made an uneventful recovery. Exactly one month after her accident, on September 16, she could be sent home. During the following month she reported regularly for ambulatory treatment of her wound, which was nearly closed on October 16.

COMMENT

The case history of a compound fracture in a 7 year old girl, complicated by gas infection and successfully treated after all other measures had failed with 240,000 units of penicillin, deserves some additional comment on its unusual features. With the exception of a fatal railroad injury many years ago, this was the first case of gas infection within the last ten years in this High Sierra region. The earliest possible suggestive clinical symptoms before any other diagnostic signs were present were the unexplainable severe pains and excitement. As a last resort penicillin was given after all hope had been abandoned for a recovery, which came like a miracle. Aware that only control series of cases can establish the usefulness of a new potent agent in this infection, uncommon in civilian life, our observation might encourage and justify this new treatment in future cases of this ever present menace of war injuries.

1. Keefer, C. S.; Blake, F. G.; Marshall, E. K., Jr.; Lockwood, J. S., and Wood, W. B., Jr.: *Penicillin in the Treatment of Infections*, J. A. M. A. 122:1217 (Aug. 28) 1943.

2. "Dr. Chester Keefer, chairman of the Committee on Chemotherapeutic and Other Agents, Division of Medical Sciences, National Research Council, and consultant to the Committee on Medical Research of the Office of Scientific Research and Development, recommended that penicillin be provided from a supply assigned to be used in clinical investigation."

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT. HOWARD A. CARTER, Secretary.

ZENITH RADIONIC HEARING AID ACCEPTABLE

Manufacturer: Zenith Radio Corporation, 6001 Dickens Avenue, Chicago.

The Zenith Radionic Hearing Aid is a vacuum tube instrument consisting of a transmitter, a magnetic receiver and a battery unit. The device was examined by the Council and the results of this examination are as follows:

Model #H.A.—Weights and overall dimensions of the various parts were as follows:

Transmitter, 5¼ inches by 2¾ inches by 1 inch, weight 5 ounces.
Receiver ¾ inch in diameter.
Batteries 13 ounces.
Total weight of the instrument, cords and batteries, 20 ounces.

Batteries.—Voltages and current drains are as follows:

A-Battery 1.5 volts
Current drain at ½ volume 84 milliamperes
Current drain at full volume 84 milliamperes
B-Battery 45 volts
Current drain at ½ volume 0.31 milliampere
Current drain at full volume 0.54 milliampere

All required data have been furnished by the manufacturer.

Acoustical Gain.—(Average of observations of two trained observers using fitted ear molds seated 5 feet from loud speaker delivering frequencies of pure sine wave characteristics.)

Observations have been made of response at ½, ¾ and full intensity and a change in characteristic obtained by shifting tone control. Intensity readings were observed at frequencies 256, 512 and so on, as shown.

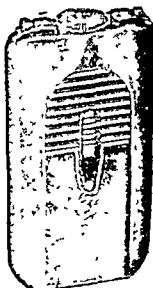
Volume Control Set at	Tone Control at Position #1						
	256	512	1,024	1,448	2,048	2,896	4,096
½	7	5	26	21	15	8	3
¾	10	11	38	27	24	13	10
Full	11	13	39	26	25	14	9

Volume at ½ Full Tone Control Set at	Tone Control at Position #1						
	256	512	1,024	1,448	2,048	2,896	4,096
#1	7	5	26	21	15	8	3
#2	9	5	15	21	15	18	14
#3	7	8	11	14	9	11	15
#4	10	4	12	17	8	12	9

The values given show gain at ½, ¾ and full volume control settings under ideal conditions, but not the electrical amplification as shown by measurements of electrical input and output.

Physical and Mechanical Features.—The instrument consists of a black plastic molded case with pleasing appearance but somewhat larger than the majority of available hearing aids. The set is well made and of sturdy construction. A practical feature is the arrangement by which the pocket clip can be attached to either the front or the back of the instrument. Three controls consisting of an on-and-off switch, a disk shaped volume control and a tone control with four points of different frequency emphasis are at the top of the case. In the circuit there is a supplementary automatic volume control. The set includes four sizes of earpieces and a small plastic tube which attaches to the magnetic receiver. Over the end of the plastic tube is fitted the flanged soft rubber earpiece which holds the tube in position in the external meatus of the canal. This device may be somewhat difficult to adjust, and some patients tested did not like to use it and preferred a plastic molded ear piece.

Performance.—In general the instrument performed as represented. The tone control did not give quite as straightforward a shift in frequency response as might be desired. This criti-



Zenith Radionic
Hearing Aid Model
H.A.

cism may be applied to any make of instrument having tone control adjustments.

The booklet of instructions is complete, the servicing program is good, the guaranty form is standard.

The manufacturer does not advocate audiometric testing when fitting the Zenith Radionic Hearing Aid. The firm holds this to be unnecessary, since the hearing aid is satisfactorily fitted in the opinion of the manufacturer in most cases by the patient adjusting the tone and volume control of the instrument to suit his hearing deficiency. In cases in which the earpiece supplied with the instrument is unsatisfactory for the patient, an especially fitted plastic earpiece can be obtained from the manufacturer at a nominal cost.

The Council on Physical Therapy voted to accept the Zenith Radionic Hearing Aid for inclusion in its list of accepted devices.

Council on Foods and Nutrition

ACCEPTED FOODS

THE FOLLOWING ADDITIONAL FOODS HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON FOODS AND NUTRITION OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO ACCEPTED FOODS.

GEORGE K. ANDERSON, M.D., Secretary.

PREPARATIONS USED IN THE FEEDING OF INFANTS (See Accepted Foods, 1939, p. 156).

Harold H. Clapp, Inc., Rochester, N. Y.

CLAPP'S BRAND CHOPPED CHICKEN SOUP WITH VEGETABLES AND NOODLES, canned chopped mixture of chicken broth, chicken, carrots, noodles, celery, salt and parsley.

Analysis (submitted by manufacturer).—Moisture 91.0%, total solids 9.0%, protein (N × 6.25) 2.1%, ash 1.2%, fat (ether extract), 0.8%, crude fiber 0.1%, carbohydrate (by difference, not including crude fiber) 4.8%, calcium 0.009%, phosphorus 0.013%, iron 0.009%. Vitamins, thiamine 1.02 mg., riboflavin 0.05 mg., ascorbic acid 0.2 mg. per hundred grams.

Calories.—0.35 per gram; 9.9 per avoirdupois ounce.

Harold H. Clapp, Inc., Rochester, N. Y.

CLAPP'S BRAND CHOPPED CREAMED VEGETABLES, creamed chopped mixture of tomatoes, potatoes, carrots, cream, green beans, flour, celery and salt.

Analysis (submitted by manufacturer).—Moisture 89.7%, total solids 10.3%, ash 1.1%, fat (ether extract) 0.6%, protein (N × 6.25) 1.0%, crude fiber 0.2%, carbohydrate other than crude fiber (by difference) 7.4%, calcium 0.009%, phosphorus 0.013%, iron 0.009%. Vitamins, carotene 3,300 U. S. P. units, thiamine 0.04 mg., riboflavin 0.08 mg., ascorbic acid 0.2 mg. per hundred grams.

Calories.—0.39 per gram; 11.1 per ounce.

Harold H. Clapp, Inc., Rochester, N. Y.

CLAPP'S BRAND STRAINED VEGETABLES WITH LAMB AND RICE AND BARLEY, canned strained mixture of lamb broth, potatoes, carrots, lamb, peas, polished rice, celery, barley, salt and onions.

Analysis (submitted by manufacturer).—Moisture 88.0%, total solids 12.0%, ash 1.2%, fat (ether extract) 1.1%, protein (N × 6.25) 1.9%, crude fiber 0.2%, carbohydrate other than crude fiber (by difference) 7.6%, calcium 0.021%, phosphorus 0.021%, iron 0.006%. Vitamins, carotene 900 U. S. P. units, thiamine 0.02 mg., riboflavin 0.09 mg. per hundred grams.

Calories.—0.48 per gram; 13.6 per avoirdupois ounce.

Libby, McNeill and Libby, Chicago.

LIBBY'S BRAND HOMOGENIZED APPLES AND APRICOTS.

Analysis (submitted by manufacturer).—Moisture 86.06%, total solids 13.94%, ash 0.24%, fat 0.06%, protein (N × 6.25) 0.50 %, crude fiber 0.58%, total carbohydrates (other than crude fiber) by difference 12.53%, salt (as sodium chloride) 0.06%, iron (mg. per hundred grams) 1.00%, copper (mg. per hundred grams) 0.24%, calcium (mg. per hundred grams) 10.90%, phosphorus (mg. per hundred grams) 14.90%.

Calories.—0.5 per gram; 14.93 per ounce.

Libby, McNeill & Libby, Chicago.

LIBBY'S BRAND HOMOGENIZED STRING BEANS.

Analysis (submitted by manufacturer).—Moisture 92.90%, total solids 7.10%, ash 1.12%, fat 0.04%, protein 1.28%, crude fiber 0.84%, carbohydrate 3.28%, salt, (as sodium chloride) 0.76%, iron (mg. per hundred grams) 2.13%, copper (mg. per hundred grams) 0.09%, calcium (mg. per hundred grams) 31.00%, phosphorus (mg. per hundred grams) 36.09%.

Calories.—0.18 per gram; 5.27 per ounce

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SATURDAY, FEBRUARY 5, 1944

CONGRESSES ON MEDICAL EDUCATION
AND LICENSURE AND ON
INDUSTRIAL HEALTH

For the first time the Congress on Medical Education and Licensure¹ and the Congress on Industrial Health² will be held jointly at the Palmer House in Chicago, February 14, 15 and 16. This arrangement will enable those primarily interested in one of the programs to benefit from the other as well, with but little extra investment of time.

Among topics of importance to be discussed are wartime problems of immediate concern in undergraduate and graduate education and the performance of recent graduates in the armed forces. One session will be concerned with postwar adjustments of the medical school program, graduate and postgraduate training, the returning medical officer who has had his advanced training interrupted, the financing of higher education, and the distribution of medical care.

The licensure programs will include a symposium on accelerated medical training and related licensure implications and discussions of recent medical legislation of general importance.

Advancement of medical standards depends largely on proper medical education and improved medical organization. No other group is more aware of this dependence or more willing to contribute toward self improvement than are the physicians in industry. This close relationship between the Congresses on Medical Education and Industrial Health signifies intensification of interest by medical educators in the whole field of preventive medicine and the growing necessity for proper preparation of physicians for modern industrial health activity. If this happy association continues, the year 1944 can be regarded as a milestone in industrial medical progress.

The Congress on Industrial Health will continue its past emphasis on the necessity for teamwork to reduce

industrial disability—teamwork between medicine, industry, labor and official agencies. Proposals will also be outlined for maintaining a high level of interest in industrial health and welfare after the stimulus of war production is over. Of great importance during the coming months will be the reestablishment of the disabled as self-supporting social units. A complete description of current rehabilitation programs will be presented. Rehabilitation, workmen's compensation and medicine have much in common, and joint opportunities for better service to the disabled will occupy a prominent place on the program. The employment of large numbers of women in industry has created new medical and health problems which will be the subject of a half-day symposium. Other important contributions include the psychosomatic approach in industry, nutrition, aviation medicine, tuberculosis, chemotherapy, sanitation, health education and industrial ophthalmology. Every physician interested in the orderly and scientific development of medical services for the industrially employed is cordially invited to attend.

HISTAMINE SPECIFIC ANTIBODIES

An ingenious new technic for the study of the role of histamine in anaphylactic shock and related clinical conditions is recently reported by Fell and his co-workers¹ of the Research and Biological Research Laboratories, Parke, Davis & Co. The original Dale² theory of anaphylaxis assumed that a combination of antigen and antibody leads to the explosive liberation of pre-formed histamine from the sensitized tissues, the dominant symptoms of anaphylaxis being due to this liberated cellular histamine. Clinical evidence has been obtained in recent years³ both in support and in contraversion of this theory.

Two main methods have been used to study this phenomenon. For example, animals can be rendered slightly refractory to histamine by previous injection of this substance. Certain investigators⁴ report that this induced histamine refractoriness reduces the severity of subsequent anaphylactic shock. Other equally competent investigators report negative results. Attempts to neutralize or destroy the hypothetical histamine by prophylactic injection of "histaminase" has also been tried with both positive⁵ and negative⁶ results.

Since these two methods have thus given inconclusive evidence, Fell and his co-workers adopted a third method: the attempted production of histamine specific antibodies by using histamine as a specific

1. Fell, Norbert; Rodney, Gertrude, and Marshall, Donald E.: *J. Immunol.* **47**: 237, 251 (Sept.) 1943.
2. Dale, H. H.: *Lancet* **1**: 1285 (June 22) 1929.
3. Farmer, Laurence: *J. Lab. & Clin. Med.* **26**: 802 (Feb.) 1941.
4. Farmer, Laurence: *J. Immunol.* **36**: 37 (Jan.) 1939.
5. Karady, S., and Browne, J. S. L.: *J. Immunol.* **37**: 463 (Nov.) 1939.
6. Alexander, H. L., and Bottom, Donald: *J. Immunol.* **39**: 457 (Dec.) 1940.

1. For complete program see THE JOURNAL, January 29, p. 310.
2. For complete program see THE JOURNAL, January 22, p. 240.

haptene conjugated with an inert protein carrier. The protein selected for this conjugation was despeciated normal horse serum globulin⁷ prepared by partial digestion of normal globulin with taka diastase. In itself the despeciated globulin is practically nonantigenic for guinea pigs. Two conjugates have thus far been prepared: a histamine-azoprotein (Landsteiner technic) and a more complex product obtained by coupling the isocyanate derivative of histamine with the despeciated globulin.

Both conjugates were found to be antigenic for guinea pigs, giving rise to relatively high titer histamine specific precipitins and conferring on the animal a specific insusceptibility to histamine. Guinea pigs thus rendered specifically histamine refractory were subsequently sensitized both actively and passively to crystalline ovalbumin, with an equal number of non-histamine refractory controls. Both series were then injected intravenously with a shocking dose of ovalbumin. In the control series nearly all animals died of lethal anaphylactic shock. Only mild or negative anaphylactic reactions were noted in the histamine resistant animals.

The results of these tests seem to confirm the original theory that the explosive release of histamine by sensitized tissues is a dominant feature of acute anaphylactic shock in this animal species and that immunization with artificial histamine-protein complexes might be a logical prophylactic method in human medicine. A clinical study of histamine-azoprotein prophylaxis has been under way for several years in the University of Michigan,⁸ with results "sufficiently encouraging to justify a continuation of the study."

The general technic adopted by Fell and his co-workers has been applied to a study of other pharmacologically active chemical substances. Clutton,⁹ for example, immunized rats against thyroxine-globulin conjugates and showed that the resulting immunity would inhibit the metabolic effects of subsequently injected thyroxine. The normal function of endogenous thyroxine, however, was not affected. Epinephrine-azoproteins,¹⁰ acetylsalicylic acid globulin conjugates,¹¹ strychnine-protein complexes,¹² and organic arsenic compounds coupled with globulin¹³ are also successful haptene specific antigens, conferring a distinct degree of serologic immunity against homologous toxic or therapeutic agents.

7. Coghill, R. D.; Fell, Norbert; Creighton, Martha, and Brown, Gordon: *J. Immunol.* **39**: 207 (Sept.) 1940.

8. Sheldon, J. M.; Fell, Norbert; Johnston, J. H., and Howes, H. A.: *J. Allergy* **13**: 18 (Nov.) 1941.

9. Clutton, R. F.; Harington, C. R., and Yuill, M. E.: *Biochem. J.* **32**: 1119 (July) 1938.

10. Went, S., and Kesztyüs, L.: *Arch. f. exper. Path. u. Pharmacol.* **193**: 609, 1939.

11. Butler, G. C.; Harington, C. R., and Yuill, M. E.: *Biochem. J.* **34**: 838 (June) 1940.

12. Hooker, S. B., and Boyd, W. C.: *J. Immunol.* **38**: 479 (June) 1940.

13. Singer, E.: *Australian J. Exper. Biol. & M. Sc.* **20**: 209 (Sept.) 1942.

PSYCHIATRIC PROBLEMS OF A GERMAN CONCENTRATION CAMP

Bettelheim,¹ a psychologist of repute who has been an inmate of the Dachau and the Buchenwald concentration camps, reports an interesting study of the psychologic effects of "extreme situations" on groups of people. He believes that some of the aims of the Gestapo in establishing concentration camps were to break the prisoners as individual human beings and to change them into docile masses from which individual or group acts of resistance could not arise. It wished to spread terror among the rest of the population by using the prisoners as hostages for good behavior, demonstrating what happens to those who oppose the Nazi rulers. It aims also to provide the Gestapo members with a training ground in which they would be educated to lose all human emotions and attitudes. Thus the Gestapo would learn the most effective ways of breaking resistance in a defenseless civilian population. In other words, the Gestapo is provided with an experimental laboratory in which to study the effective means for breaking civilian resistance. In the process the minimum food, hygienic and medical requirements needed to keep the ability of prisoners to perform hard labor when the threat of punishment takes the place of all other normal incentives is determined as well as the influence on performance of removal of every activity but hard labor in prisoners separated from their families. The author is particularly concerned with the concentration camp as a means of producing changes in the prisoners which will make them more useful subjects of the Nazi state. In analyzing this development Bettelheim recognizes three stages. The first of these centers around the initial shock of finding oneself in unlawful imprisonment. The main event of the second stage is the transportation to the camp and the first experiences in it. This involves often the first tortures which the prisoner has ever experienced. They are, as a rule, physically and psychologically the worst torture to which he will ever be exposed. The final stage is a slow process of changing the prisoner's life and personality. It occurs step by step, continuously. It is the adaptation to the camp situation.

The purpose of the tortures was to break the resistance of the prisoners and to assure the guards that they were really superior to the prisoners. The author's own reaction was to safeguard his ego so that he would be approximately the same person that he was when he was deprived of his liberty if by any good luck he should regain it. The prisoners he interviewed all insisted that the main problem was "to remain alive and unchanged." All the emotional efforts of new prisoners were directed toward this goal. Old prisoners seemed mainly concerned with the problem of how

1. Bettelheim, Bruno: *Individual and Mass Behavior in Extreme Situations*, *J. Abnorm. & Social Psychol.* **35**: 417 (Oct.) 1945.

to live as well as possible in the camp. They realized that they had adapted themselves to the life in the camp and that this process was coexistent with a basic change in their personalities. The acceptance of camp life as real never took place before spending two years in camp. Even hatred became subdued in old prisoners. They had forgotten to love their kin, and they had lost the ability to hate the oppressor. They had learned to direct a great amount of aggression against themselves so as not to get into too many conflicts with the Gestapo; the new prisoners still directed their aggressions against the outer world and, when not supervised, against the Gestapo. The longer a prisoner had been in camp the less true to reality were his daydreams. All changes produced by living in the camp seemed to force the prisoners back into childhood attitudes and behaviors, and they became in this way more or less willing tools of the Gestapo.

A prisoner had reached the final stage of adjustment to the camp situation when he had changed his personality so as to accept as his own the values of the Gestapo. Slowly prisoners accepted, as expressions of their verbal aggressions, terms which definitely did not originate in their previous vocabularies but were taken over from the far different vocabulary of the Gestapo. From copying the verbal aggressions of the Gestapo to copying their forms of bodily aggressions was one more step, but it took several years to make this step. The author states that it was not unusual to find old prisoners, when in charge of others, being worse than the Gestapo, in some cases because they were trying to win favor with the Gestapo in this way, but more often because they considered this the best way to behave with prisoners in the camp. Old prisoners who seemed to have a tendency to identify themselves with the Gestapo would try to arrogate to themselves old pieces of Gestapo uniforms. They accepted the Gestapo's goals and values, even when these seemed opposed to their own interests.

More important is the influence of the concentration camp as the main training ground for young Gestapo soldiers who are planning to rule and police Germany and all conquered nations. The prison camp is the Gestapo's laboratory in which are developed methods for changing free and upright citizens into grumbling slaves and serfs who in many respects accept their master's values. What happens in an extreme phase to prisoners who spend several years in the concentration camp happens in less exaggerated form to the inhabitants of the big concentration camp called Greater Germany. This effect, the author stresses, ought to be studied by all persons interested in understanding what happens to a population subject to the methods of the Nazi system.

Bondy² also concludes that it is almost impossible for a person to stay in an internment camp for a long

time without undergoing radical physical, mental and moral changes. He believes that the internment camps will become an immediate problem after the defeat of the enemy and that methods for dissolving them should be studied now. He suggests (1) a systematic study of the literature on internment camps, (2) systematic interviews with former internees, (3) systematic direct studies of prisoners of war and civil prisoners in internment camps and (4) a special study of German prisoners of war now in this country; this would help to bring to light what needs to be done after Germany is conquered.

LAXITY IN WARTIME PHARMACEUTICAL MANUFACTURE

Apparently the circumstances created by the war have produced some relaxation of standards and control procedures established to insure the identity, purity and potency of medicinal materials. In recent months the Chemical Laboratory of the American Medical Association has found serious discrepancies between the labeling and the actual contents of materials submitted by several drug manufacturers. Each instance has been called to the attention of the manufacturer concerned. The public, the physician and the pharmacist depend in large measure on the manufacturer of pharmaceuticals for many finished dosage forms of drugs which, experience has shown, can be provided efficiently by modern mass production methods. Possible loss of life or wasted man-hours of work, resulting from faulty dosage traceable to mislabeling, cannot be tolerated.

The cooperative efforts of physicians, pharmacists and manufacturers of pharmaceuticals have resulted in the adoption and constant improvement of criteria designed to facilitate accuracy in prescribing, dispensing and preparing of drugs. Such criteria are embodied in New and Nonofficial Remedies, in the Pharmacopeia of the United States and in the National Formulary. Ultimate responsibility for marketed dosage forms of drugs, such as ampules, tablets and suppositories, lies with the manufacturer. The physician and the pharmacist must be able to depend on the labeling statements of such products, particularly with regard to potency and identity. The integrity of many manufacturers justifies this trust; if such trust is betrayed there exist punitive legal restrictions. There can be no positive guaranty that error may not occur in the processes involved in the transformation of raw materials into finished medicinal products. Careful control measures and constant vigilance by the manufacturer will minimize dangers inherent in false identity, low purity or wide variation in potency of products employed to maintain or restore health.

The personnel and physical equipment of all manufacturing organizations in the United States are under constant stress. Manufacturers of drugs and medicinals

2. Bondy, Curt: Problems of Internment Camps, *J. Abnorm. & Social Psychol.* 38: 453 (Oct.) 1943.

have not been exempt from the loss of trained workers and from the necessity for full utilization of all available machinery in their tremendous job of providing adequate supplies of medicines for the armed forces and for the public. Nevertheless manufacturers of pharmaceuticals need to scrutinize and steadily improve their methods of product control.

Current Comment

THE SOCIAL SECURITY BOARD

The Annual Report of the Social Security Board was recently sent to the Congress by Mr. Paul V. McNutt, Federal Security Administrator. The Report of the Social Security Board was under the name and authority of Mr. Arthur J. Altmeyer. Some sections of this report are so reminiscent of the "rubber stamp" phrases of the economists and social service workers who have been agitating for government medicine and compulsory sickness insurance since 1932 that one thinks almost immediately of that famous Biblical phrase "The voice is Jacob's voice, but the hands are the hands of Esau." For instance,

For the individual family, medical costs are unpredictable and largely uncontrollable. In any given year, medical needs will confront some families with economic disaster and others with a burden which can be met only by sacrifices of other essentials, but no one can predict which families these will be.

That language might well be characterized as by Isidore S. Falk out of Michael M. Davis. The report asserts the belief of the Social Security Board that

comprehensive measures can and should be undertaken to distribute medical costs and assure access to services of hospitals, physicians, laboratories and the like to all who have need of them.

It is suggested that redistribution of existing costs be made through insurance devices

effected in such a way as to preserve free choice of doctor or hospital and personal relationships between physicians and their patients, to maintain professional leadership, to ensure adequate remuneration—very probably, more nearly adequate than that in customary circumstances—to all practitioners and institutions furnishing medical and health services, and to guarantee the continued independence of nongovernmental hospitals.

This phraseology indicates the effect of medical activities on the thinking of the Social Security Board, but the only answer of the board evidently is still compulsory sickness insurance. The direct relationship between Mr. I. S. Falk and the proposals of the Wagner-Murray-Dingell bill makes clear how far the proposed legislation misses in attaining the fundamental principles that are considered necessary by the medical profession in maintaining the quality of medical service. The concluding sentence of the section of the report which deals with medicine is as follows: "The Social Security Board believes that provisions for health and medical care have an important place in any comprehensive and adequate program of social security."

HEAD INJURIES IN CHILDREN

The highly sensitive cortical cells and psychic constitution of the child are most important in determining the higher incidence of a number of pathologic conditions following head injuries at this age, chiefly abnormal behavior, psychopathic personality and convulsive seizures. These factors were analyzed by Gutmann and Horder¹ in a group of 66 children. The effects of head injuries in this group were compared to those occurring in a group of adults. The degree and intensity of disturbances immediately following the trauma were mainly dependent on the severity of the craniocerebral lesions. Fractures of the skull were present in 43.3 per cent of the children or about twice as frequently as among adults. The same percentage of patients exhibited definite signs of neurologic involvement including various conditions from abnormalities of tendon reflexes to the development of convulsive spells. The incidence of convulsions a few hours after the accident was also higher among children. Unconsciousness or post-traumatic amnesia was present in 38 patients. During the recovery of consciousness emotional symptoms were predominant, but they disappeared rather suddenly. The mental and physical incapacity produced by head injuries was shorter than is generally believed. If a few instances of relatively rare complications are disregarded, the average time of absence from school was only four weeks. Also in contrast to the general belief, the incidence of late sequelae of head injury was minimal. In almost every instance of neurotic syndromes, irritability, psychic disturbances and pathologic behavior, close analysis showed that evidence of abnormal psychic constitution existed prior to the accident. Environmental factors and previous history of conduct should be carefully examined before attributing to traumatic injuries responsibility for deterioration of character in children.

LIBERTY SHIP NAMED FOR NATHAN SMITH DAVIS

As a salute to the contribution of the American medical profession to the war, a war-cargo ship—a so-called liberty ship—was launched Thursday, January 27, at Shipyard No. 2 of the Permanente Metals Corporation of Richmond, Calif., one of the Henry Kaiser interests. The vessel was christened the *Nathan S. Davis* in honor of the founder of the American Medical Association. In 1947 the American Medical Association will celebrate the 100th anniversary of its founding. The Board of Trustees of the Association has under consideration the celebration of this important event in a suitable manner. The dedication of this vessel in honor of Nathan Smith Davis and another in honor of Frederick Banting may be taken as indications of the appreciation of the American people of the great contribution that medicine has made not only to the war but also to the standards of health and medical education in the United States.

1. Gutmann, E., and Horder, H.: Head Injuries in Children and Their After-Effects, *Arch. Dis. Childhood* 18: 139 (Sept.) 1943.

YOUTH PROBLEMS ON THE AIR

The National Broadcasting Company, in cooperation with ten national organizations¹ representing the interests of American youth, is broadcasting a series of thirteen programs entitled "Here's to Youth." The program is on the air for thirteen weeks beginning Saturday January 15 from 7 to 7:30 p. m. Eastern war time (6 to 6:30 Central war time, 5 to 5:30 Mountain war time, 4 to 4:30 Pacific war time). It is a professionally written, fast moving dramatic series with sound effects and music, combining entertainment and, in the best sense of the word, propaganda. The purpose of the program is to dramatize the problems and difficulties of youth in a scrambled wartime economy and to point out ways for the solution of these problems. The first script was an introductory one in which American youth is introduced in contrast to Nazi youth. The participating organizations are identified and there is a dramatization having to do with the difficulties of finding a place to play because wartime necessities have taken over the diamonds in vacant lots, destroyed or put out of bounds the old fishing hole and otherwise created situations which faced young persons with the alternative of boredom or of activities which would do them no good. The second script dealt with the social isolation of trailer town folks who are not floaters and who had been substantial citizens in more settled communities. This would seem to be an American approach to a difficult problem. Instead of running to Washington with outstretched palm and demanding that the government appropriate millions and establish another federal bureau, the youth agencies concerned, together with the National Broadcasting Company, are trying to mobilize communities for local cooperation and are showing in each script exactly how it can be done. This is an example of community cooperation by which wartime problems can be solved if there is a solution. It is a splendid suggestion to postwar planners that the American spirit of enterprise is not dead and that it does not need to center in the nation's capital.

THE HANDBOOK OF NUTRITION

The long awaited Handbook of Nutrition,¹ published under the auspices of the Council on Foods and Nutrition of the American Medical Association, has just become available. As was announced when the first articles appeared in *THE JOURNAL* in 1942, all the articles have been brought together and revised and are now published in book form. The contents include such subjects as the fundamentals of modern nutrition, the essential elements in the diet, their sources in naturally occurring foods and methods by which the greatest benefit may be derived from the consumption

of cheap staple foods. Special attention is given to the dietary needs of special groups of the population. The book is invaluable as a reference for those in the field of nutrition and exceedingly useful to the physician who wishes to apply modern knowledge of nutrition in his practice.

THE COMMONWEALTH FUND

The report of the Commonwealth Fund for 1943 contains a review of its contributions for a period of twenty-five years, since its origin on Oct. 17, 1918. During those twenty-five years over \$41,000,000 has been appropriated to various projects by this foundation. Its first grant was for war service; during its first five years nearly half of its total appropriations were for war service and overseas relief. Among the chief fields of its interest have been the prevention of juvenile delinquency and the betterment of child health, also mental hygiene. However, medical research and public health have taken a majority of the funds. In his review of a quarter century of giving, Barry C. Smith, general director of the Commonwealth Fund, speaks frankly. After telling of a series of demonstrations of child health services as part of the local public health program and indicating that they served to broaden current concepts of public health, he says that, on the whole, they were disappointing as instruments for improving public health service. Efforts to raise the standard of public health services have been most successful by cooperation with state health departments in areas in which the county is the normal unit of public health services and less successful in other areas. Especially important has been the work of this fund in developing rural hospital facilities. Fourteen small community hospitals now in operation typify the results of this contribution. Much money has been given to medical education, with special emphasis on graduate education in the field of medicine. About \$16,000,000 has been given during the past quarter century for the support of health service as related to the work of the physician, the health department and the hospital. Much additional money has been spent on medical research, with special reference to cardiorenal physiology and disease, but a great variety of projects have been included and numerous fellowships have been provided to British and Latin American students. The review closes with a most careful philosophic consideration by Mr. Barry Smith of the difficulties of spending money wisely in service to mankind. The short term project has an advantage that it can be abandoned if it seems to fail to meet its objectives, but it is vulnerable because those working under such projects may not make positive commitments of time or service. The long term project with fixed objectives allows adjustments but sooner or later becomes dated or arbitrary; "there is a temptation to fit situations to the program instead of the program to the situation." Indeed, one of the chief advantages in the spending of the funds has been the professional development of carefully selected individuals who themselves help to create new social programs of the future or to build up the knowledge on which future programs will be based.

1. Girl Scouts, Boy Scouts, Boys Club of America, Camp Fire Girls, National Catholic Welfare Conference, National Federation of Settlements, Y. M. C. A., Y. W. C. A., American Junior Red Cross, National Jewish Welfare Board.

1. Handbook of Nutrition: A Symposium Prepared under the Auspices of the Council on Foods and Nutrition of the American Medical Association. Reprinted from *The Journal of the American Medical Association* with Additions. Cloth. Price, \$2.50. Pp. 586. Chicago, American Medical Association, 1943.

MEDICINE AND THE WAR

In this section of *The Journal* each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeons General of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war, and such other information and announcements as will be useful to the medical profession.

ARMY

AVIATION MEDICAL EXAMINERS

Graduating exercises were held at the School of Aviation Medicine, Randolph Field, Texas, on January 6 following completion of the course for aviation medical examiners. The list of medical corps students graduating follows:

ALABAMA
Chalmers D Collins Major, Birmingham
Saul Krugman Captain, Selma

ARIZONA
Marvin C Schlechte, Major, Tucson

ARKANSAS
James B Kittrell, Captain, Texarkana

CALIFORNIA
Franklin I Ball Major, Los Angeles (North Hollywood)
Laurence H Dorcy, Major, San Francisco
David D Holdav, Captain, San Francisco
Samuel A Jones Captain, Los Angeles
Paul McChesney Captain, Berkeley
Emerson L Meyer, Captain, Healdsburg

COLORADO
William C Beaver, Captain Pueblo

FLORIDA
Jack Q Cleveland, Captain, Coral Gables
Edwin P Preston, Major, Miami Beach
William B Wilkins Captain Palm Beach

GEORGIA
Allen W Coward, Captain, Macon

ILLINOIS
William L DeRenne, Captain, Chicago
Harold Feldman, Captain, Pekin
Roy R Grinker, Lieut Col, Chicago
Weston W Jones, Captain, Evans ton
Edward W Kallal, Captain, Chicago
Philip H Ross Captain, Chicago
Leland M Stilwell, Captain, Champraign

INDIANA
Matthew Cornacchione, Major, Indianapolis
John M Paris Jr, Captain, Indianapolis
Robert C Peacock 1st Lieut, Dunkirk

IOWA
Asa S Arent Captain, Humboldt
Walker B Henderson, Lieut Col, Oelwein
John L Kimball Jr, Captain, West Liberty
Norman E Zahrt Captain, Iowa City

KANSAS
Edgar P Sereres, Captain, Kansas City

KENTUCKY
Charles E Work, Major, Fort Thomas

LOUISIANA
Floyd N Beckcom, Captain, Shreveport
Eric E Guilbern Jr, Captain, Lafayette

Frederick A Marx Captain, New Orleans
John P Michaels Captain, New Orleans
Paul W Winder Major, Shreveport

MASSACHUSETTS
Ira M Dix, Major Stockbridge
Frank J Jordan Jr, Captain, Stoughton
Paul L Magnuson Captain, New Bedford
Frank M O'Connor, 1st Lieut, Newton
Herbert F R Plass Captain, Boston
Thos A Warthin, Captain, Boston

MICHIGAN
Nelson A Andrews Captain, Flushing
Cliff rd W Colwell Major Flint
George Christensen Fredericksen Captain Detroit
William Haeck Captain Grand Rapids
Arthur B Thompson 1st Lieut, Saginaw
Jack V Turnbull Captain Detroit
Kenneth P Wolfe Captain Alma

MINNESOTA
Russell G Barnes Jr 1st Lieut, Hastings
Asher S Chapman Captain, Rochester

MISSISSIPPI
Donald S Hall Captain, Vicksburg

MISSOURI
Robert W Elliott Captain, St Louis
Calderick K Hamilton Captain, Kirkwood

NEBRASKA
Charles J (reel) Major, Omaha

NEW HAMPSHIRE
Kenneth J Doherty Major, Manchester
Philip L Dinkle Captain Hebron
Thomas L Foley Captain Manchester

NEW JERSEY
Anthony V Chase Captain New Brunswick
Vincent Felicino Captain, Hawthorne
Harry F Lindrich Captain Camden (Merchantville)
Edward J (uncertain) Captain, Elizabeth
Paul V Remartz Captain Newark (Bloomfield)

NEW MEXICO
Wendell H Lebeck Major, Farmington

NEW YORK
Vincent L Amir Captain Rockland Lake
Ardow Ameduri Captain, New York
Richard B Baker Captain, New York
Robert R Cadmus Captain, New York

John A Canning, Captain, Brooklyn
Milford N Childs, Major, Buffalo
Eugene S Coler, Lieut Col, New York
Maxwell H Dale, Captain, New York
Barnet Delson, Captain, Brooklyn
Edwin H Douglass Jr, Captain, Newburgh
Max Eisenstat, Major, New York
Carl M Epstein, Captain, New York
Francis H Fox, Captain, Brooklyn
William L Haitmann, Captain, New York
Abraham I Levine, Captain, Brooklyn
Jay G Linn Jr, 1st Lieut, New York
Lloyd J Nelson Captain, Queens Village
Robert W Ollajos 1st Lieut, New York
Joseph F Palmieri, Captain, Brooklyn
Robert C Peale, Captain, Olean
Harmon T Rhoads Jr, Captain, New York
Milton Robbins, Captain Brooklyn
Jeremiah E Ryan, 1st Lieut, Binghamton
Allan W Siegner, Captain, Buffalo
Barnett Soloyoff, 1st Lieut, New York
Isaac Terr Captain, Woodmere

NORTH CAROLINA
Richard W Bunn, Captain, Winston Salem

OHIO
Carl T Doering, Major, Springfield
David C Frick Major, Toledo
Gilbert E Garvin Captain, Blanchester
Edward F Hellwig, Captain, Cleveland
Benjamin F Mowry, Major, Findlay
Benjamin F Sawyer IV, Captain, North Star
Merl B Smith Captain, Toledo
George M Wilcoxon, Captain, Alliance

OKLAHOMA
Imus A Munding, Captain, Tulsa

OREGON
Palmer R Grorud, Captain, Portland

PENNSYLVANIA
John J DeTuerk, Captain, Erie
Chester J Gmieczi, 1st Lieut, Philadelphia
Eugene M Hartnett, 1st Lieut, Philadelphia
Romuald J Krjeski, Captain, Wilkes Barre
John Kulczycki Jr, Major, Scranton
George S Pettis, Captain, Reading
Irving A Rush, Major, Philadelphia
Francis Schumann, 1st Lieut, Philadelphia
Arthur I Sums Captain Philadelphia
Morgan F Taylor, Captain Hop Bottom
Harvey G Wible, Major, Pittsburgh

SOUTH CAROLINA
Harold M Allison, Major, Greenville

TENNESSEE
Jesse F Scott, Captain, Nashville

TEXAS
Joe W Dickerson, Captain, Jaster
Joe T Gilbert Major, Austin
Arthur E Moers, 1st Lieut, Fort Worth
James J Muirhead, Captain, Vernon
Samuel Schwartzberg, Captain, San Antonio
Lewis K Tester, Major, San Angelo

WASHINGTON
Oscar W Anderson, Captain, Seattle
William Y Baker, Captain, Seattle
Clyde W Countryman, Lieut Col, Spokane

WEST VIRGINIA
Robert M Lamb, Captain, Winona

WISCONSIN
Carl S Williamson, Colonel, Green Bay

In addition there were 4 graduates of the Medical Corps of the Chinese army and 1 of the Argentine army, which are as follows:

Tsuyung Chen (Chinese army), Captain
Sikung Liu (Chinese army), Captain
Shrohn Sieh (Chinese army), Captain
Yung Ching Tai (Chinese army), Captain
Raul Marty (Argentine army), 1st Lieut Buenos Aires

GRADUATE MEDICAL ADMINISTRATIVE OFFICERS

The twenty-ninth class of the Camp Berkeley Medical Administrative Corps Officer Candidate School graduated on January 12 following a sixteen weeks course of training and instruction on subjects that included medical administration, supply, army organization, sanitation first aid, chemical warfare, tactics, logistics and training. Special stress was put on the development of leadership and physical stamina. Certificates of graduation and letters of commission were presented to the new officers by Brig Gen Roy C Heflebower, school commandant.

KANSAS CITY (MO.) HOSPITAL UNIT IN ENGLAND

Lieut. Col. Edward Hashinger, now home on leave for a new assignment, returned to Kansas City, Mo., from overseas, where he was chief of medicine and executive officer of the University of Kansas evacuation unit. In reporting on the unit, Colonel Hashinger stated that during its eighteen months overseas the outfit served throughout the Tunisian campaign from the landing at Oran and handled thousands of battle casualties. He paid special commendation to the nursing staff, of which Miss Bessie Walker, formerly of St. Luke's Hospital, Kansas City, Mo., is the chief. During the invasion of Sicily a number of the younger officers and enlisted men were assigned temporarily to the Navy to serve on landing barges. They were given citations by the Navy for meritorious service in the landings at Gela and Licata. Each member of the unit wears three campaign stars on the European theater ribbon, one for invasion and one for the South Tunisian and another for the Sicilian campaign. In Sicily the unit functioned as a hospital, handling medical cases such as malaria in the rear. They had no casualties other than a few patients with malaria, who quickly recovered, although there were more than forty air raids in the vicinity of the evacuation hospital unit. At the conclusion of the Sicilian invasion the unit was transferred to England, where it is at present. The unit consists of approximately 50 medical officers, 50 nurses and 300 enlisted men. Practically all the personnel are from Kansas City or the immediate territory, and many officers are from the University of Kansas hospital staff. Major Tony G. Dillon of Kansas City is now the executive officer of the unit.

ARMY NURSE AND ARMY DIETITIAN TELL THEIR EXPERIENCES ABOARD "SEMINOLE"

The War Department recently disclosed the experiences of Lieut. Margaret Jennings, Army Nurse Corps, formerly of Spring Lake, N. J., and Lieut. Lois Thomas, army dietitian, formerly of Syracuse, N. Y., during their six months service aboard the army hospital ship *Seminole*. Lieutenant Jennings stated that the *Seminole* had been blacked out to await the arrival of patients from the shore hospital at Naples when the first of twenty-five Nazi bombers roared overhead. "As we were blacked out, they had no way of telling that we were a hospital ship and I suppose they mistook us for a troop transport. In any case, they gave us the works!" Although the raid lasted a long sixty minutes, there were no casualties aboard the *Seminole*.

Another experience which the officers related was that of an enemy submarine which rose to periscope depth during a burial ceremony aboard the hospital ship and kept the ship under observation until the ceremony was concluded. The U boat withdrew at the approach of a merchant convoy, which it attacked. During the cruise to Naples the ship rescued two British and four American fliers from the sea. Lieutenant Jennings and Lieutenant Thomas were high in their praise of hospital installations in combat areas, which send patients to such ships as the *Seminole* in wonderful condition.

IMPLICATIONS OF WAIVERS FOR KNOWN PHYSICAL DEFECTS

The Office of the Judge Advocate General of the Army recently gave his opinion concerning the implications of waivers for known physical defects which physicians sign on being appointed for limited service in the Army Medical Corps. The opinion, which was released by the Procurement and Assignment Service of the War Manpower Commission, is as follows:

"Response is made to your oral inquiry whether acknowledgment, on the accompanying form, of existing physical defects would preclude a person from thereafter claiming benefits to which he would otherwise be entitled on account of the service connected aggravation of such defects. As to the defects acknowledged, the execution of such an instrument merely provides additional evidence of their existence and to that extent would operate to preclude the person involved from thereafter

claiming benefits on account of them. It is the opinion of this office, however, that the mentioned form does not purport to be a waiver of possible future benefits to which the individual might become entitled by reason of any service connected aggravation of such defects and would not operate to deprive the individual of any possible benefits on account of such aggravation."

U. S. ARMY HOSPITAL SHIP "CHATEAU THIERRY"

The United States Army transport *Chateau Thierry* was designated as a United States Army hospital ship on Nov. 29, 1943 in accordance with international practice as set forth in the provisions of the Hague Convention X of 1907. In the future the United States Army hospital ship *Chateau Thierry* will be operated in accordance with the provisions of applicable treaties. Notification of this designation was delivered, through channels, to the Rumanian government on Dec. 10, 1943, to the Bulgarian, Hungarian and German governments on Dec. 11, 1943 and to the Japanese and Thai governments on Dec. 13, 1943. The ship's master of this and all other United States military hospital ships will at all times maintain sufficient copies of this general order for presentation to any authorized agent of an enemy belligerent who may require it for inspection.

PROCUREMENT OF NURSES FOR MILITARY SERVICES

On January 8 the War Department officially notified the Directing Board of Procurement and Assignment Service that appointments to the Army Nurse Corps will be curtailed after 3,500 nurses needed early in 1944 have been procured. Thereafter only replacements will be needed. The Navy still needs nurses at the previously established rate of 500 nurses per month, but military needs may change rapidly with the course of the war. If such change occurs, the state committees will be advised at once.

Quotas soon to be released will place the major burden of procurement of nurses for military duty on those states which have supplied less than their share of nurses. But all state and local committees, as quotas are met, should direct activities more toward civilian needs for essential nursing services. A program for such activities will be released shortly; meanwhile, organization of additional local committees needed should be expedited and all efforts should be made to strengthen existing committees for the important and continuous task ahead.

FIFTY SOLDIERS VOLUNTEER FOR ATABRINE EXPERIMENT

The Armored Medical Research Laboratory at Camp Knox, Kentucky, has been carrying on experimentation to learn whether the level of atabrine concentration in the blood is lowered by excessive perspiring and to discover the loss in weight due to perspiring. The experiment was carried on with the voluntary aid of 50 soldiers, who were praised by the Surgeons General of the American and British armies during their recent inspection tour at Fort Knox. Atabrine has a dye property that turns the taker of it to a temporary rich yellow hue. The experiment revealed that the full strength of the suppressive remains and that only the water in the system evaporates. The weight loss is determined accurately by measurements made at stated intervals.

ARMY PERSONAL

In a recent news dispatch from "Somewhere in New Guinea" Capt. Charles P. Wickard of Little Rock, Ark., was credited with having administered first aid to the wounded men brought from the shores of Arawe, the allied invasion bridgehead on New Britain Island. Dr. Wickard swam among the battered rubber invasion boats, saw to it that they kept in the boats, and administered morphine to the suffering soldiers. Dr. Wickard graduated from the University of Arkansas School of Medicine, Little Rock, in 1939 and entered the service Oct. 21, 1942.

CIVILIAN DEFENSE

REALINEMENT OF EMERGENCY MEDICAL SERVICE, RESCUE SERVICE AND GAS PROTECTION UNITS

The Office of Civilian Defense recently issued a circular letter concerning the realignment of emergency medical service, rescue service and gas protection units, which will assist local commanders of Citizens Defense Corps and local chiefs of Emergency Medical Service, chiefs of Rescue Service and senior gas officers in making such readjustments in noncritical areas as may be needed in connection with the policies presented in Operations Letter No. 147.

After determining the war connected hazards to which the community is exposed, the Citizens Defense Corps may be adjusted. Members no longer needed for active service may be transferred to other appropriate units or placed in inactive status. Wherever adjustments are indicated, the Emergency Medical, Rescue and Gas Protection forces should be maintained at least at the minimum strength as indicated:

I. EMERGENCY MEDICAL SERVICE

1. In all parts of the country:

(a) Maintain Casualty Receiving Hospital mobilization plans and civilian defense ambulance services at present levels;

(b) Retain mobile medical teams and casualty stations located at or based on hospitals and reduce the number of other mobile medical teams and casualty stations on the basis of estimate of risk from war connected or other disasters;

(c) Reduce stretcher teams to the number required at hospitals and those casualty stations which are to be continued;

(d) Retain all volunteer nurses' aides on active status and continue to recruit and enroll as trained; and

(e) Develop non-air raid alerting mechanism.

2. Outside the Atlantic and Pacific coastal areas:

(a) The field and mobile elements (except ambulances) may be adjusted to the strength indicated:

(1) *Urban Centers*.—Mobile medical teams at hospitals: One per 25,000 in larger cities and not less than two per community in cities of 25,000 population or under, if possible.

Casualty stations: One per 50,000 (by consolidating equipment) or one per community of less than 50,000 population, if possible, except that no casualty station should be discontinued if needed because of proximity to war connected industrial hazard.

Staff casualty stations in time of need by mobile medical teams from hospitals, if possible.

(2) *Rural Areas*.—Chief of Emergency Medical Service, nurse deputy, medical property officer and 1 mobile medical team. The chief of Emergency Medical Service should maintain a plan for mobilization of medical and related personnel and facilities in time of disaster, maintain active contact with chief of Emergency Medical Service of nearest city with hospital facilities, and direct medical operations in any local disaster.

3. Non-air raid alerting mechanism: A non-air raid mobilization plan should be developed and rehearsed in order to make the Emergency Medical Service immediately available in event of any major wartime catastrophe due to sabotage, industrial or railroad accident, fallen plane, explosion, fire, flood, hurricane or other disaster. Such a plan would come into operation on notification of the twenty-four hour emergency control point discussed in Circular, Protection Series No. 33.

(a) As provided therein telephone numbers of this central control point should be known to the community at large and particularly to the police and fire departments, local industries, utilities and transportation officials.

(b) It may be located at the local control center if provided with twenty-four hour coverage or at a police or fire headquarters, hospital or other place with adequate communication facilities and twenty-four hour coverage by responsible persons.

(c) The "automatic response" when this control point is notified of casualties consists of:

(1) Notification of control center if control point is not located therein;

(2) Immediate dispatch of one mobile medical team and one ambulance from hospital or depot nearest to the scene of disaster if casualties are reported;

(3) Notification of chiefs of services depending on nature of emergency.

(d) On notification to the chief of Emergency Medical Service, he will assume full responsibility for:

(1) Dispatching of additional mobile medical teams, ambulances and sitting case cars;

(2) Alerting of hospitals to put in motion emergency preparations for reception of casualties;

(3) Opening and staffing casualty stations near scene of disaster;

(4) Supplying adequate plasma and other medical supplies and equipment at points of need, obtaining necessary assistance from neighboring communities or the state Emergency Medical Service;

(5) Providing to hospitals necessary additional volunteer personnel;

(6) Directing flow of patients to hospitals in community or to hospitals of other communities;

(7) Providing for immediate care of the dead.

II. GAS PROTECTION

1. In the Atlantic and Pacific coastal areas the Gas Protection forces (senior gas officer and assistants, gas reconnaissance unit and decontamination unit) should be maintained at full strength. (See Operations Letters Nos. 91 and 194, dated Nov. 14, 1942 and Jan. 11, 1943.)

2. In all other parts of the country the Gas Protection forces may be reduced to the following personnel:

(a) *Urban Centers*.—Senior gas officer assistants. One gas reconnaissance agent per 25,000 population.

(b) *Rural Areas*.—None.

III. RESCUE SERVICE

1. In the Atlantic and Pacific coastal areas and in major industrial centers the rescue service should be brought up to the strength recommended in Operations Letter No. 133, dated June 24, 1943.

2. In other parts of the country the rescue service should be maintained or brought up to the following active strength:

(a) *Urban Center*.—Chief of rescue service;

Rescue Squads: One per 100,000 persons in large cities and not less than two per community where population is less than 100,000, if possible;

Rescue Depots: One per 200,000 persons or one per community where population is less than 200,000, if possible.

It is recommended that the rescue service in these communities be developed within an agency of local government (e. g. fire, public works, police) or within local industry, and that squads be composed largely or wholly of employees.

(b) *Rural Areas*.—None.

Commanders of local Citizens Defense Corps should be responsible for obtaining rescue services from nearest city through mutual aid.

NAVY

NAME ESCORT VESSELS FOR DECEASED
NAVY HEROES

Three destroyer escort vessels are to be named for a deceased member of the Navy Medical Corps and two members of the Hospital Corps. The D. E. 590 *Ringness* is to be named in honor of Lieut. Henry R. Ringness, Medical Corps, U. S. Navy, Washington, D. C., who was awarded the Navy Cross posthumously (*THE JOURNAL*, Sept. 25, 1943, p. 219). The D. E. 707 *Jobb* is to be named in honor of Richard P. Jobb, pharmacist's mate third class, U.S.N.R. (Moclips, Wash.), and the D. E. 721 *Don A. Woods* is to be named for Don A. Woods, hospital apprentice first class, U.S.N. (Wymore, Neb.), both of whom were awarded the Silver Star Medal posthumously.

NURSE CORPS

According to the Bureau of Medicine and Surgery, Washington, D. C., Dr. Charles Nelson Leach, formerly of Montgomery, Ala., and recently repatriated, brought a report on the eleven navy nurses now prisoners of war in the Philippines. Severe military necessity forced the navy nurses and navy patients into the Manila area. Later on they assisted Dr. Leach in the care of the internees. When Santo Tomas became overcrowded the Japanese opened a new camp at Los Banos, about 40 miles from Manila. Dr. Leach and three other doctors were selected for this new development. Dr. Leach persuaded the Japanese to allow the eleven navy nurses to go to Los Banos, since by that time the nursing facilities at Santo Tomas had been augmented by the arrival of army nurses from the various army hospitals in the Philippines. Dr. Leach reports that the contribution of

the navy nurses to the care of the internees and the unfailing quality of their high morale has been invaluable in a situation imposed by the war.

FIRST AIR MEDAL AWARDED TO
MEDICAL CORPS OFFICER

Lieut. William W. Evans, formerly of New Rochelle, N. Y., is the first Navy medical officer to receive the Air Medal, a decoration which is awarded to military personnel who distinguish themselves in aerial flight, either in combat or in non-combat action. The citation accompanying the award was as follows:

"For meritorious achievement while participating in aerial flight as Squadron Flight Surgeon while attached to a Marine Aircraft Group in the Solomon Islands Area from Oct. 15, 1942 to June 26, 1943. Volunteering for extremely hazardous flights deep into enemy territory to administer aid to wounded pilots and study combat strain, Lieutenant Evans also participated in numerous dangerous missions for the purpose of maintaining the physical fitness and morale of his assigned pilots at a high level. During the violent defense on Guadalcanal Island in November 1942 he was responsible for the badly needed improvements made in the housing and preparation of supplies for pilot's mess, laboring tirelessly to improve their living conditions. Lieutenant Evans's courageous devotion to duty throughout his three tours of duty was in keeping with the highest traditions of the United States Naval Service."

Dr. Evans graduated from the University of Pennsylvania School of Medicine in 1938 and entered the Navy in March 1942.

MISCELLANEOUS

RESIDENT AND INTERN QUOTAS FOR
HOSPITALS, 1944-1945

The Procurement and Assignment Service is now setting quotas for hospital intern and resident staffs for 1944-1945. Any hospital which has had significant changes in patient load during the past year is urged to submit immediately to the Procurement and Assignment Service Central Office a report covering average daily census, births, inpatient admissions, exclusive of births, and outpatient visits for 1943. No questionnaire is being sent to hospitals for this purpose. However, it is in the interest of the hospital to send in such data, since it will be considered by the hospital subcommittee charged with setting quotas.

HOSPITALS NEEDING INTERNS
AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their house staff quotas allotted by the Procurement and Assignment Service:

(Continuation of list in *THE JOURNAL*, January 29, p. 304)

NEBRASKA

Lincoln General Hospital, Lincoln. Capacity, 303; admissions, 4,262. Robert B. Witham, Administrator (interns).

NEW YORK

Unity Hospital, Brooklyn. Capacity, 283; admissions, 5,585. Peter S. Berlind, Executive Secretary (3 interns—April).
Memorial Hospital for Cancer and Allied Diseases, New York City. Capacity 213; admissions, 5,029. Mr. George F. Holmes, Superintendent (3 assistant residents).

ROYAL ARMY AIR CORPS OFFICER
FIRST TO USE PENICILLIN

Lieut. Col. Ian Fraser, Royal Army Medical Corps officer, who was the first one to use penicillin in the front line, has been awarded the D.S.O. for doing so under heavy enemy fire on the Sicilian beaches. The citation recorded that he used technic novel to war surgery and "established new and most

valuable wound treatment." For forty-eight hours he remained ashore under shellfire and divebombing and then, before returning to his hospital ship, gave a pint of his blood to save the life of a gravely wounded man.

HEALTH UNDER HITLER

According to *Le Petit Dauphinois* of November 9 (France) the medical inspector of the Haute-Savoie announces that the distribution of insulin has been further reduced. Patients, hospitals and doctors are earnestly requested to abstain from keeping stocks of insulin. Negotiations are now in progress with foreign countries which should if successful make it possible to buy a sufficient quantity of insulin to improve the distribution within a few weeks.

Spart på Hvitt of October 7 (Norway) states that the elaborately produced book *Für ein Grossgermanien* was recently produced in Oslo and immediately sent in quantities to Germany. The book had been prepared by Rediess himself. It deals with German "child production" in Norway. Pictures of the various sanatoriums where Norwegian women and girls can go to have their German fathered children propagandized the comfortable conditions in which such happy events take place. According to Rediess, up to Dec. 15, 1942, 2,514 children were born in Norway with German fathers.

According to the *Tribune de Genève* of Nov. 5, 1943 it is reported from Paris that the food situation is deteriorating and is causing grave anxiety regarding the winter. Meat has been totally lacking for several weeks. Restaurants have been forbidden to serve meat under any form, because, while the consumers could not get meat at the butchers in exchange for their coupons, all the luxury restaurants had plenty. The restaurants are now under the control of the occupation authorities, presumably on account of the danger that the people, exasperated by unjust distribution (due to powerless officialdom), might grow violent. Uniformed Germans suddenly enter restaurants at mealtime inspecting not only the meal served but also the contents of the cellars and ice boxes.

ORGANIZATION SECTION

MEDICAL SERVICE PLANS

A REPORT FROM THE BUREAU OF MEDICAL ECONOMICS

Significant changes in the prepayment plans endorsed or supervised by state and county medical societies have made necessary a report of developments since the publication by the Bureau of Medical Economics early in 1943 of the report on "Medical Service Plans." That report described the form of organization, types of contracts and some phases of administration which existed at the time it was written. These details are not repeated in the surveys which follow.

One generalization seems safe concerning these plans—all show an increase in membership during the past year. It appears now that most of the plans are on a sound financial basis, having overcome the mistakes and difficulties which arose during their formative period and having profited by the exchange of information with other similar organizations. While numerous minor alterations in the details of contracts with subscribers and physicians have been made, it now appears that the basic features of the plans have been determined and that future changes will be in the nature of detailed improvements in service and administration.

Nearly all the plans are now supplying a surgical service only in connection with hospital care, although some are extending a more general medical service in relation to special groups. Several plans are considering the possibility of such an extension of service but are delaying action pending further experience to determine actuarial conditions. The plans in North Carolina are operated by hospital associations with separate contracts for medical or surgical service which have been approved by the state medical association.

The statements made in this study are based on the reports of the administrators of the several plans or of officials of the medical societies concerned or from official medical journals of such medical societies. No information was obtained from the medical service plans in the states of Oregon and Washington, although requests for such information were sent repeatedly to the officials of the state medical societies of those states.

In other areas developments in the field of medical service plans have not progressed beyond the stage of preliminary study, experimentation, the passage of a state enabling act or other preliminary preparation necessary to an orderly development. The developments in this field are shown graphically in a report prepared this week for the readers of THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION and all others interested in this subject.

CALIFORNIA PHYSICIANS' SERVICE

SAN FRANCISCO

A. E. LARSEN, M.D., Medical Director

California Physicians' Service in November 1943 had a beneficiary membership of 87,670.¹ Of these there were 51,550 "commercial members" representing those enrolled directly in the service. The Rural Health Program included 5,000 and is conducted in cooperation with the Farm Security Administration. This program "has now small units covering some nineteen counties and is a starting nucleus for further development in these programs, which are covering the great majority of the agricultural areas in the state." War housing projects have approximately 31,120 clients. The experimental character of these projects has necessitated several changes in the financial arrangements and in some other respects but are now reported to be proceeding satisfactorily. After passing through some

financial crises, the entire plan had a unit stabilization fund of \$39,299 at the close of September 1943.

The Executive Committee of the California Medical Association authorized a survey of the California Physicians' Service by John R. Mannix, director of the Michigan Hospital Service. His report, published in *California and Western Medicine* in November 1943, discusses the reasons for the apparently slow growth in membership and recommends a number of actions to be taken. The Council of the California Medical Association has approved most of these recommendations and has voted to employ a full time executive secretary for sufficient time to develop the proposed changes.

COLORADO MEDICAL SERVICE, INC.

DENVER

WILLIAM S. McNARY, Executive Director

A report of Oct. 31, 1943 showed 4,108 active contracts of enrolment covering seventy groups and 10,089 subscribers. A reserve of \$2,795.66 had been accumulated during the previous eighteen months, which covered the period since organization. During this period \$33,858.25 had been received from subscribers and \$27,977.17 paid in fees to participating physicians.

The Denver County Medical Society has approved a plan for enrolment of groups without income limits, the individuals receiving service who are above the previous limits to be paid on an indemnity basis.

GROUP HOSPITAL SERVICE, INC.

WILMINGTON, DEL.

H. V. MAYBEE, Managing Director

The independent surgical contract has been abandoned and a rider to the hospitalization contract substituted. This is because of the decision to issue surgical contracts only to subscribers to the hospital service. Since the offering of the surgical service, May 1, 1943, 11,000 members have been acquired and a reserve of over \$11,000 accumulated. Only 75 per cent of the fee schedule has been paid to physicians, but sufficient reserves in excess of the amount mentioned have now been set aside to pay the additional 25 per cent.

MASSACHUSETTS MEDICAL SERVICE

BOSTON

JAMES C. McCANN, M.D., President

Enabling legislation was procured on May 22, 1941. The Council of the Massachusetts Medical Society voted a fund of \$25,000 for the initial expenses in establishing the Massachusetts Medical Service. The Commissioner of Insurance ruled that \$5,000 of this amount could be used for initial expenses, but the remaining \$20,000 had to be placed on deposit under a letter of trust with the requirement that the amount should not be further reduced until after a surplus of \$225,000 had been reached.

The program was initiated with a surgical-obstetric contract to be broadened, first, to complete hospital coverage and later to as near complete medical coverage as is feasible. The program is to be administered on a contract basis with the Blue Cross organization.

1. *California & West. Med.* 59: 347 (Dec.) 1943.

During the first six months, ended in June 1943, growth was slow—only 7,000 being enrolled—but at the end of the next six months 23,000 in two hundred groups had enrolled. In a number of instances the employer had paid all premiums. This was permitted as a substitute for an increase in wages.

Some liberalization of group enrolment has been found possible without endangering actuarial safety. This has been accomplished by substituting specific tested standards for a fixed percentage of group membership. These standards are based on (1) the "seasoning" of the group as determined by the period of enrolment in "Blue Cross" hospitalization plans, (2) the loss ratio shown by such experience and (3) the "cultural" level of the group. The plan is now operating on what is considered a sound financial basis and has set up reserves to meet obstetric care and tonsillectomies, which, under the contract, are not available during the first year of enrolment. It is expected that a surplus will soon be accumulated which will make it possible to extend coverage to hospitalized medical cases.

MICHIGAN MEDICAL SERVICE

DETROIT

JAY C. KETCHUM, Executive Vice President

The number of subscribers has increased from 440,000 on March 1, 1943 to 600,455 on Nov. 30, 1943. The deficit as shown by the audit of Dec. 31, 1942 was \$439,778.04; Sept. 30, 1943 it had been reduced to \$270,382.57. Total income from fees in the nine months ended Sept. 30, 1943 was \$2,428,125.70. Final audit for Dec. 31, 1943 had not been completed in time for this report, but the deficit was estimated to have been reduced to about \$150,000.

Premium rates are now 60 cents a month for the individual subscriber in a group, increasing 5 cents for each 15 per cent of females in the group to a maximum of 90 cents, \$1.60 for individual and spouse and \$2.25 for a family.

SURGICAL CARE, INC.

KANSAS CITY, MO.

F. K. HELSBY, Director, Group Hospital Service

A statewide plan was prepared on Dec. 11, 1937, and an enabling act has been enacted. Jackson and Wyandotte counties (Kansas City) operated a plan, Surgical Care, Inc., during 1943 which has paid all claims 100 per cent from earned income.* As of Dec. 15, 1943, 6,500 persons had been enrolled in two hundred groups.

New groups are being enrolled daily, and the administration considers that the operation of the plan has been successful so far.

MEDICAL SERVICE ADMINISTRATION OF NEW JERSEY

NEWARK

NORMAN M. SCOTT, M.D., Medical Director

The Medical Society of New Jersey has approved of the organization of two nonprofit medical service corporations under the provisions of an act passed by the state legislature in 1940.

These corporations operate nonprofit medical service plans for the payment of medical services, with money received from their subscribers or with grants received from governmental agencies for payment of medical care rendered needy persons.

The administrative policies of these corporations are governed by boards of trustees consisting of eight members nominated by the Medical Society of New Jersey. They are under supervision of the New Jersey Department of Banking and Insurance.

Medical Service Administration of New Jersey.—The administration operates medical service plans for the benefit of selected low income groups, the medical indigent and the indigent.

Farm Security Medical Plan.—The administration has operated the Farm Security Administration Medical Plan for the benefit of Farm Security clients in New Jersey since May 1941. This plan provides payment for medical care rendered in the home of the patient or office of the physician. It does not include cost of hospitalization or medical care rendered in a hospital. Physicians' fees are \$1.50 for office calls and \$2.50 for home calls. Subscription rates are \$16 for individuals, \$20 for husband and wife, \$21 for a family of three, \$22 for a family of four, \$23 for a family of five and \$24 for a family of six or more.

During recent months the plan has frequently had deficits owing to unsatisfactory enrolment and high sick rates.

City of Newark Medical Plan.—This plan replaces the former arrangement under which indigent persons in the city of Newark were cared for by city physicians. The plan provides for free choice of physicians and payment by the Medical Service Administration Plan for medical care rendered to persons whose names appear on the rolls of the Newark Department of Welfare who are confined to their homes because of illness. The plan does not include payment for office calls, this type of service being rendered through existing clinic facilities. Physicians are paid \$2 for a day visit and \$3 for a night visit, the adequacy and eligibility of service being passed on by a committee of the Essex County Medical Society, which reviews the bills each month. Expenditures by the Medical Service Administration Plan for this care are reimbursed monthly by the Newark Department of Welfare, plus 10 per cent toward administrative costs.

Arrangements are now being completed for the inclusion of certain selected medically indigent groups under this plan.

The Medical-Surgical Plan of New Jersey.—This plan is organized as a separate corporation in order to facilitate accounting methods and avoid support of other plans by money received from its subscribers.

As of Nov. 30, 1943 Medical-Surgical Plan had total effective enrolment of 14,977 persons covered by 6,940 contracts.

From its earned income it has paid all organization and administrative expenses and paid physicians for all eligible services in accordance with 100 per cent of its predetermined schedule of payments.

For the eleven months ended Nov. 30, 1943 its expenditures from its earned income were:

Expenditures	Per Cent of Earned Subscription Income
Claims (paid and accrued).....	61.38
Solicitation	9.83
Administration	15.03
Reserve	13.76
	100.00

MEDICAL AND SURGICAL CARE, INC.

UTICA, N. Y.

H. C. STEPHENSON, Managing Director

In ten months ended Oct. 31, 1943 the total receipts were \$111,851.14, with \$39,346.47 as funds on hand, of which \$15,029.91 was earned surplus. In September 1943 it had sold 9,629 contracts covering 19,215 persons.* Some enrolment is obtained from farm bureau and granges, and clients of the Farm Security Administration have been enrolled for four years for hospitalization, and the plan is now considering their enrolment for a low cost surgical plan. There are no income limits as the indemnity plan is used, with total payments in one year restricted to \$225 for the subscriber, \$125 for one dependent and \$350 for any three or more persons covered by a contract.

The success of the original plan led to the offer of a "low cost" plan with lower enrolment rates and somewhat restricted benefits and limits of \$200, \$100 and \$325 to the classes mentioned. A rider to contracts is also offered covering general medical services, also on the indemnity plan, paying \$2 for office and hospital calls and \$3 for home calls for subscribers and \$1 and \$1.50 for corresponding services to dependents. Calls are limited to fifty-two for subscriber and one hundred and fifty for subscriber and all dependents in one year.

J. Lockwood, Ira, H.: Prepayment Plan for Cases Requiring Surgery and Hospitalization, Kansas City M. J. 14:14 (Nov.-Dec.) 1943.

3. Bulletin 62, Public Relations Bureau, Medical Society of the State of New York, Jan. 1, 1944.

MEDICAL EXPENSE FUND OF
NEW YORK, INC.³

BROOKLYN

F. E. ELLIOTT, M.D., Secretary-Treasurer

This is the pioneer of the four medical plans now operating in this state. It has some 5,000 subscribers, almost an equal number of participating physicians. Sixteen of its trustees are physicians; eight are laymen. In 1942 Medical Expense, Inc., met all its obligations in full. Mr. Rowland H. George is president; Dr. Frederic E. Elliott is secretary-treasurer; Dr. Charles Gordon Heyd is chairman of the general advisory board.

WESTERN NEW YORK MEDICAL PLAN, INC.

BUFFALO

CARL M. METZGER, Executive Director

The Dec. 1, 1943 membership was 22,000, having doubled since March 1, 1943. Operating on the indemnity plan, the physician renders his bill, of which the plan pays the amount stipulated in the contract and notifies the patient and the physician of the amount, if any, still due. Since the indemnity schedule roughly corresponds to the prevailing fees charged in the income group up to \$3,000, the physician is urged to consider the economic status of the individual patient and to accept the indemnity payable by the corporation as a full discharge of the liability of the patient, if such patient is within the average income group.

Although 75 per cent is the basis of settlement, with a subsequent payment at the end of the year, since the introduction of the new contract the plan has paid the doctor the full amount of the indemnity schedule.

MEDICAL SERVICE ASSOCIATION, INC.

DURHAM, N. C.

E. D. MALLARD, Assistant Secretary

Memberships are sold by the Hospital Care Association, which also administers the plan. The subscription rates apply to both organizations and are distributed as shown:

	Weekly	To Medical Service	To Hospital- ization
Male employees	\$0.33	\$0.20	\$0.13
Female employees .....	.37	.20	.17
Employees, >1 dependent ..	.55	.25	.30
Family, all children under 18	.65	.25	.40

Two dollars a day is paid for the first eight days to the physician caring for a patient in the hospital with a non-surgical illness. Not more than two consultation fees of \$5 each are paid. A total of \$50 is allowed for medical care in one year. Surgeons receive \$75 for major and \$15 for minor operations requiring hospitalization. Twenty-five dollars is paid for a delivery. On Oct. 30, 1943 there were 4,177 enrolments in the Medical Service Association, covering 13,031 persons.

HOSPITAL SAVINGS ASSOCIATION OF
NORTH CAROLINA, INC.

CHAPEL HILL

E. B. CRAWFORD, Executive Director

In December 1943 there were approximately 210,000 participants in the plan, of whom 40,000 were covered by a combined program of hospitalization and surgical care. There are no income limits, but 80 per cent of the membership has incomes under \$1,500 a year.

There is a statewide plan for Farm Security Administration under government contract. Approximately 2,500 families are covered (14,000 persons) and hospitalization furnished for only \$12 annually. The surgical plan pays physicians on a fee schedule, and payments are on an indemnity basis toward regular charges. Surgical care is limited to \$75 a year per person. There has been no accurate breakdown of costs between the hospitalization and the surgical plan, but it is estimated that surgical claims have absorbed about 75 per cent of the income.

MEDICAL SERVICE ASSOCIATION
OF PENNSYLVANIA

HARRISBURG

RALPH W. DAVIES, Field Director

There were approximately 8,500 subscribers as of Jan. 1, 1944. The following income limits on enrolment have been established with the provision that those earning above these limits are enrolled on an indemnity or credit basis: individual, \$30 weekly; with 1 dependent, \$45, and with more than 1 dependent \$60 weekly.

When the income of any subscriber has exceeded these limits for the twenty-five preceding weeks, the physician may make an additional charge for his services and the association will pay only the amount specified in the fee schedule. A revision of the fee schedule is now in process and the maximum allowance will be increased from 50 to 75 units. The basic value of the unit is \$2.

DALLAS COUNTY MEDICAL PLAN

DALLAS, TEXAS

The State Medical Association of Texas in 1941 asked the state legislature for an enabling act to permit the establishment of prepayment plans by medical societies, but the legislature did not enact such a law, and there is now some doubt of its necessity. The Dallas County Medical Plan has continued to operate successfully with no significant changes. The monthly subscription rate was increased on July 1, 1943 from \$1.50 to \$1.75, and the \$5 deductible clause dropped. There were 378 subscribers as of Dec. 1, 1943.⁴

The Council on Medical Economics of the state medical association has worked out a plan for the state which the Council reports would "have solved important problems" had legislation been enacted to permit its expansion.⁵ Texas is largely a rural state, and especial attention has been given to Farm Security Administration programs, which in 1943 were conducted in 122 counties and served 33,793 persons.⁶

Migratory camps are conducted in eight localities. Experimental programs are conducted by the Farm Security Administration in Cass County covering 2,379 families, or one third of the population in an "over-all medical program," and in Wheeler County serving 1,000 families. These two programs are subsidized by the Farm Security Administration at a cost of \$75,000.

UTAH MEDICAL & HOSPITAL
BENEFIT ASSOCIATION

SALT LAKE CITY

W. H. TIBBALS, Executive Secretary

Because of apparent inability to secure sufficient volume, it has been deemed best to urge the hospitals to organize a Blue Cross Plan for the purpose of handling hospitalization on a service basis. This is now in process.

4. Report received from Dr. D. W. Carter Jr., secretary-treasurer, Dallas County Medical Plan.

5. Texas State J. Med. 38: 89 (June) 1942.

6. Texas State J. Med. 39: 88 (June) 1943.

NATIONAL CONFERENCE ON MEDICAL SERVICE

The eighteenth annual meeting of the National Conference on Medical Service will be held Sunday, February 13, at the Palmer House in Chicago. The program is as follows:

MORNING

The Association of American Physicians and Surgeons

Plans of Lake County, Ind., physicians for a national organization
ROLLIN W. WATKINSON, Gary, Ind. Executive Secretary of the Lake County Medical Society

Proposals by the Medical Societies of New England

Six New England medical societies join in a statement proposing alternatives to the Warner-Murray-Dingell program.

MICHAEL A. TIGHE, M.D., Lowell. Secretary, Massachusetts Medical Society.

The Western Public Health League

Organization formed by eleven western medical associations
DWIGHT H. MURRAY, M.D., Napa, Calif. Chairman of the Western Public Health League

Discussion

BEN H. REAP, San Francisco. Executive Secretary, Public Health League of California.

Report from the Council on Medical Service and Public Relations

Created by the House of Delegates of the American Medical Association in June 1943

L. H. BAUER, M.D., Hempstead, N. Y. Chairman, Council of Medical Service and Public Relations

AFTERNOON

The Doctor's Job

HON. WALTER H. JUDD, Washington, D. C. Congressman from the Fifth District, Minnesota

Social and Economic Trends in Relation to Medical Practice
W. L. BURNAP, M.D., Fergus Falls, Minn. President, National Conference on Medical Service

The Challenge to American Medicine

E. H. SKINNER, M.D., Kansas City, Mo. Editor, Kansas City Medical Journal

Digest of Recent Medical Legislation

J. W. HOLLOWAY, JR., Chicago. Director, Bureau of Legal-Medicine and Legislation, American Medical Association

Obstetric and Pediatric Care for Soldiers' Wives and Infants

W. W. BAUER, M.D., Chicago. Director, Bureau of Health Education, American Medical Association

Dr. W. L. Burnap, Fergus Falls, Minn., is president, and Dr. C. L. Palmer, Pittsburgh, is secretary of the conference.

DOCTORS AT WAR

Radio broadcasts of Doctors at War by the American Medical Association in cooperation with the National Broadcasting Company and the Medical Department of the United States Army and the United States Navy are on the air each Saturday at 4:30 p. m. Eastern war time (3:30 p. m. Central-war time, 2:30 p. m. Mountain war time and 1:30 p. m. Pacific war time). The titles and guest speakers for the next three programs are as follows:

February 5. "White Battalions."

Speaker, Col. Florence A. Blanchfield, Army Nurse Corps, Office of the Surgeon General, Washington, D. C.

February 12. "Selective Placement in Industry."

Speaker, Harold A. Vonachen, M.D., medical director, Caterpillar Tractor Company, Peoria, Ill.

February 19. "Hometown Heroes."

Speaker, James E. Paullin, M.D., President, American Medical Association.

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status.—S. 1633 has passed the Senate, proposing to amend the nurses' training act so as to provide that the head of any federal agency, department or establishment may request and accept transfers of student nurses to a federal hospital who are transferrable under the original act. H. J. Res. 208 has passed the Senate, authorizing additional appropriations for the supplying and distribution of farm labor. This bill was amended on the floor of the Senate so that funds available for providing health and medical services to recruited farm laborers may be used to provide such services to migratory workers and their families who have entered an area without recruitment or assistance of any government agency and have engaged in agricultural work and to whom adequate health and medical services are not otherwise available in the area where they are working. H. R. 4070 has been reported to the House, making appropriations for the Executive Office and sundry independent executive bureaus, boards, commissions and offices for the fiscal year ending June 30, 1945. This bill, among other things, appropriates the sum of \$7,374,500 for use by the Administrator of Veterans' Affairs for extending any of the facilities under the jurisdiction of the Veterans' Administration. This appropriation may not be used to provide additional beds. The committee report suggests that funds for such additional beds may be made available at a later date. The bill also authorizes the Administrator to employ medical consultants for duty on such terms as he may deem advisable and without regard to the civil service and classification laws.

Bills Introduced.—S. 1670, introduced by Senator Thomas of Utah, proposes to promote the welfare of the people by establishing a publicly supported adult education program stemming from the state universities and land-grant colleges. Such extension courses will serve, among others, individuals interested in gaining knowledge of public safety, sanitation, health, nutrition, recreation, housing, government, town planning, school facilities and social welfare services. H. R. 4027, introduced by Representative Peterson, Florida, provides that in the administration of laws pertaining to veterans, retired officers and enlisted men of the Army, Navy, Marine Corps and Coast Guard shall be

entitled to hospitalization and domiciliary care. H. R. 4051, introduced by Representative Beall, Maryland, H. R. 4052, introduced by Representative Hays, Arkansas, H. R. 4055, introduced by Representative Rogers, California, and H. R. 4057, introduced by Representative Rankin, Mississippi, propose to enact the Servicemen's Aid Act of 1944. These bills would declare the Veterans' Administration to be a vital agency of the United States entitled to priority second only to the War and Navy departments, would direct the construction of additional hospital beds for veterans and would authorize the Administrator of Veterans' Affairs and the Secretary of War and the Secretary of the Navy to enter into agreements and contracts for the mutual use or exchange of use of hospital facilities. H. R. 4063, introduced by Representative Peterson, Florida, would authorize the President to appoint optometrists as commissioned officers in the Medical Corps of the Army and Navy on the recommendation of the Surgeon General of the Army or Navy, as the case may be. H. R. 4072, introduced by Representative Weiss, Pennsylvania, proposes to grant commissions in the Army to members of local selective service boards.

STATE MEDICAL LEGISLATION

New York

Bills Introduced.—A. 252 proposes to require the board of education of each city and of each school district maintaining public schools to provide, in cooperation with the local department of health or health officer, adequate health services for pupils attending such schools who are 15 years of age or over. A. 362, to amend those provisions of the medical practice act relating to annual registration, proposes that the list of registered physicians and dentists shall be published and mailed on March 1 in each even numbered year after 1944 instead of annually, as the present law provides. It also proposes to strike out the provision in the present law that the names of physicians who are added to the list after the printing and distribution of the list shall be reported quarterly on request to the secretary of the state medical society. A. 369 proposes to make it a felony, punishable by imprisonment for not less than one and one-half years nor more than three years, for a person, knowing himself to be infected with venereal disease, to have sexual

intercourse with another person. The present law applies only to such person having sexual intercourse with persons in the military or naval service.

Virginia

Bill Introduced.—H. 29 proposes to repeal the existing medical practice act and to enact in its stead an entire new act. The board of examiners, it is proposed, is to consist of one "regular medical doctor" from each congressional district and one homeopath, one osteopath, one chiropractor and one naturopath from the state at large. All applicants for licenses to practice any form of the healing art must pass examinations given by this board. All applicants, regardless of the system of practice that they intend to pursue, must pass examinations given by the members of the board who are "medical doctors" in anatomy, histology, physiology, physiological physics and chemistry, and pathology and bacteriology or microbiology. After successfully passing the examination in the aforementioned subjects, an applicant for a license to practice osteopathy, chiropractic or naturopathy must pass examinations given by the full board in medical jurisprudence, public health and hygiene, and the philosophy, practice and therapeutics of the particular school or branch of the healing art of which the applicant is a devotee.

An applicant for a license to practice medicine or homeopathy must pass examinations to be given by the full board in the practice of medicine, pediatrics, neurology and psychiatry, surgery, including gynecology, obstetrics, including embryology, materia medica and therapeutics, and medical jurisprudence, public health and hygiene. The bill defines the practice of osteopathy as the treatment of human ailments, diseases or infirmities by any means or method other than surgery or drugs, and provision is made whereby osteopaths may obtain licenses to practice medicine and surgery without restriction. Chiropractic is defined as the treatment of human ailments, diseases or infirmities by manual adjustment of the twenty-four movable vertebrae of the spinal column for the purpose of relieving pressure on the spinal nerves. Naturopathy is defined as treatment by means of heat, light, diet, massage, baths and other natural agents but does not include the use of surgery, the x-rays, x-ray therapy, electrotherapeutics or the prescribing of any drug or medicine. S. 53 proposes to authorize the establishment and maintenance of an institution, to be known as the Virginia Institute of Psychiatry, for the study, treatment, prevention and research of mental disorders and the training of student nurses and physicians.

WOMAN'S AUXILIARY

Arkansas

The Sevier County auxiliary voted to send *Hygeia* to the schools of the county. Its programs for the year include such topics as "Pioneer Doctors of Sevier County," "Penicillin," "Public Health in Other Counties" and "Hygeia." Mrs. L. J. Kosminsky, state president, spoke at the November meeting.

The Sebastian County auxiliary prepared Christmas boxes for the Camp Chafee station hospital patients. It also contributed funds for the purchase of the Arkansas Tuberculosis Sanatorium at Booneville.

Kansas

The Sedgwick County auxiliary will hold three social meetings a year; the rest of the meeting time will be spent in rolling bandages at the Red Cross office. At the October meeting Mrs. L. E. Knapp discussed "Alice in Wonderland, 1943."

The Wyandotte County auxiliary held a luncheon recently at the home of Mrs. L. M. Nason in Kansas City. Mrs. F. F. Kimball spoke on "Can We Have a Just and Honorable Peace?"

At a recent meeting of the Saline County auxiliary "Medical Practice in the Army" and "Flight Surgery" were discussed by two doctors from nearby camps. Eleven wives of army physicians have joined the auxiliary.

Minnesota

The Minnesota medical auxiliary held its fall board meeting on October 22. Mrs. F. S. McKinney presided, and three major projects of the year were discussed. Mrs. Claude Kennedy explained the aims of the Medical and Surgical Relief Committee, Mrs. Harlow Hansen outlined plans for individual counties in aiding the emergency nursing committee and Mrs. Ivar Sivertsen presented the Cadet Nurse Corps.

The Ramsey County auxiliary opened its new year with an informal tea at the home of Mrs. Gordon Kamman of St. Paul.

The Nicollet-LeSueur auxiliary recently had a dinner at the Burton Hotel in Mankato.

The Hennepin County auxiliary recently had a tea at the home of Mrs. A. E. Benjamin, at which time thirty-one charter members of the original eighty-two were honored guests. Mrs. Harold Wahlquist, president, presided, and the program was devoted to a review of the organization's thirty-three years' existence. Mrs. W. J. Byrnes, first president, gave reminiscences and told of the aims of the group, which was the first medical auxiliary in the United States. In November the auxiliary entertained the dentists' wives and the wives of doctors in service at Fort Snelling, Wold Chamberlain Airport and the university. The auxiliary recently sponsored the sale of articles made by patients of the Glen Lake Sanitarium, from which more than \$2,000 was obtained.

Mississippi

The officers of the Mississippi auxiliary are Mrs. H. C. Ricks, president, Jackson; Mrs. L. J. Clark, president-elect, Vicksburg; Mrs. V. B. Philpot, first vice president, Houston; Mrs. Henry Boswell, second vice president, Sanatorium; Mrs. W. H. Anderson, third vice president, Booneville; Mrs. Stanley Hill, assistant, Corinth; Mrs. R. B. Caldwell, fourth vice president, Baldwin; Mrs. George E. Riley, recording secretary, Jackson; Mrs. J. D. Simmons, treasurer, Cleveland; Mrs. Harvey Garrison Sr., history and archives, Jackson, and Mrs. W. C. Pool, parliamentarian, Carey.

Guests representing auxiliaries in ten different states attended the tea opening the 1943-1944 season of the Woman's Auxiliary to the Central Medical Society, at the home of Mrs. H. C. Ricks, Jackson.

Ohio

Fourteen members were present at the fall board meeting of the Ohio auxiliary held in Columbus recently. Charles S. Nelson, executive secretary of the Ohio State Medical Association, discussed the Wagner-Murray-Dingell bill and plans for combating its enactment. The next annual meeting of the auxiliary will be held in Columbus, May 2-4. Mrs. John G. Briggs was named convention chairman.

The auxiliaries of Butler, Franklin, Highland, Mahoning, Ross and Summit counties had fall meetings.

Texas

The Dallas County auxiliary recently had a luncheon at the Melrose Hotel in Dallas in honor of Mrs. A. B. Pumphrey, Fort Worth, state president. Mrs. Pumphrey spoke on "The American Way of Life."

Mrs. Samuel Heald was guest speaker at a recent meeting of the Harris County auxiliary. She spoke on "Present Day Problems in South America." Mrs. Heald lived in Panama for twenty-three years, and during World War I she was head of the home service of the American Red Cross and was awarded the St. John of Jerusalem decoration by the British government for her work with the British Red Cross.

During the third war loan drive the auxiliary members of the Taylor-Jones counties sold bonds amounting to \$4,550.

Mrs. A. B. Pumphrey, state president, was guest speaker at the October meeting of the McLennan County auxiliary.

The Hattie Hunt auxiliary and the Liberty-Chambers County auxiliary held meetings recently.

Texas recently lost two members, Mrs. C. P. Carlisle of Dallas, who died October 11, and Mrs. J. D. Magee of Abilene, who died October 19.

Medical News

(PHYSICIANS WILL CONFERR A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Conferences on Psychiatry.—The department of psychiatry at Mount Zion Hospital, San Francisco, will begin a series of evening conferences on February 9 devoted to some principles of child guidance as illustrated by case presentations. The first two conferences, February 9 and February 23, are being devoted to a "Behavior Disorder in a Boy of Five."

IDAHO

Dr. G. R. Smith Named State Health Director.—Dr. George R. Smith, Boise, medical superintendent of the state mental institution at Blackfoot, has been appointed state director of public health. Dr. Smith graduated at Creighton University School of Medicine, Omaha, in 1909. Dr. Lynn J. Lull has been appointed director of local public health services in Idaho. He was formerly director of the division of venereal disease control for the Colorado State Division of Public Health, Denver.

ILLINOIS

The Swanberg Medical Foundation.—Dr. Harold Swanberg, Quincy, has set up an irrevocable trust, organized not for pecuniary profit, that will eventually enable the Adams County Medical Society "to sponsor or undertake one or more things of a charitable, scientific, literary or educational nature, that would not be possible or would be difficult to undertake without the financial aid of the foundation and which will bring public and professional honor and respect to the medical profession." The trust, which was approved by the Adams County Medical Society in December, is being administered by a board of trustees of eight physicians, serving without remuneration. Contributions may be made by any individual to the new foundation, which will be known as the Swanberg Medical Foundation. According to the *Mississippi Valley Medical Journal*, Dr. Swanberg plans to make further contributions as his income permits, but no project will be sponsored until the funds exceed \$10,000.

Chicago

Personal.—Dr. Esther C. Marting, formerly director of the tumor clinic of the Cincinnati General Hospital and instructor in surgery at the University of Cincinnati College of Medicine, has joined the staff of the Chicago Tumor Institute.

Cancer Committee Affiliates with Tuberculosis Institute.—The Tuberculosis Institute of Chicago and Cook County has accepted an affiliation of the Chicago Cancer Committee, organized to promote anticancer activities in the Chicago area. Dr. Ludvig Hektoen, executive director of the National Advisory Cancer Council, is chairman of the Chicago Cancer Committee.

Dr. Bevan's Estate Revalued at Over a Million Dollars.—Dr. Arthur Dean Bevan, who died June 10, 1943, left an estate of \$1,683,777 instead of \$600,000 originally estimated, newspapers report. The estate, with the exception of some personal bequests, is placed in trust for Mrs. Anna Bevan, widow of Dr. Bevan. Eventually the bulk of the estate will go to Presbyterian Hospital and Rush Medical College. The Lake Forest Hospital will get \$25,000.

KANSAS

Physicians Share Work of Resigned Director of Maternal Health.—Dr. Floyd C. Beelman with the assistance of Dr. Harry R. Ross, Topeka, is directing the work of the division of maternal and child health of the Kansas State Board of Health, pending the appointment of a person to succeed Dr. William Fred Mayes, resigned. Dr. Beelman is secretary of the state board.

Graduate Course on Venereal Disease.—The University of Kansas School of Medicine, the state board of health and the Kansas Medical Society are cooperating in a series of post-graduate courses on venereal diseases to be held at the following places throughout the state:

Kansas City, February 1-2.
Parsons, February 3-4.
Wichita, February 5-7.
Hutchinson, February 7-8.

Dodge City, February 9-10.
Topeka, February 12-13.
Beloit, February 14-15.
Salina, February 16-17.

Instructors in the courses will be Drs. Percy S. Pelouze, assistant professor of urology, University of Pennsylvania School of Medicine, Philadelphia, and special consultant to the U. S. Public Health Service, and Dr. John Philip Berger, Wichita, assistant to Dr. Udo J. Wile, head of the department of dermatology and syphilology, University of Michigan Medical School, Ann Arbor, and medical director of the division of venereal disease control of the U. S. Public Health Service.

MICHIGAN

Dr. Coggeshall on Leave of Absence.—Dr. Lowell T. Coggeshall, professor of epidemiology, University of Michigan School of Public Health, Ann Arbor, has been granted a leave of absence to become medical director for the Marine rehabilitation program on the west coast, newspapers reported, January 4.

The Beaumont Lecture.—Dr. Frank D. Dickson, associate professor of clinical surgery, University of Kansas School of Medicine, will deliver the annual Beaumont Lecture, February 21, at the Detroit Institute of Arts under the auspices of the Wayne County Medical Society. He will discuss "Osteomyelitis."

Conference on the Deaf and the Hard of Hearing.—The Professional Association of the Michigan School for the Deaf conducted a conference in Flint, February 3-5. Sessions were devoted to the slow-learning child, the hard of hearing and deafened, home life and mental hygiene, hearing conservation, vocational adjustment, speech development, motivation, language development, mental hygiene, the spastic child, reading for the deaf and higher education.

Dr. Littlejohn Named Medical Director of Wayne County.—Dr. David Littlejohn, Sault Ste. Marie, for the past seven years director of the Chippewa County Health Department, became director of the Wayne County Health Department on February 1. Dr. Littlejohn once served as acting state health commissioner of West Virginia. He graduated at the Central Medical College of St. Joseph, Mo., in 1897. The Wayne County Department of Health was created in 1943, and Dr. Joseph G. Molner had been serving as acting director until the selection of a permanent appointee.

Physician Sentenced for Obstructing Justice.—Dr. Martin B. Robinson, Detroit, entered Southern Michigan Prison, January 5, to begin serving a sentence of from three to five years for conspiracy to obstruct justice, newspapers reported. The physician was sentenced in Wayne County, Nov. 13, 1940. He lost his appeal in the U. S. Supreme Court. Newspapers identify Dr. Robinson as a "numbers-house operator" and stated that his arrest "set off Detroit's grand jury investigation into vice and gambling." The *Detroit Free Press* stated that Robinson's conviction came nearly eleven months after "four hoodlums allegedly held up Robinson, opening a series of events which resulted in inauguration of the graft grand jury and a major police shakeup."

MISSOURI

Mickle Fellowship Awarded to Dr. Graham.—The University of Toronto Faculty of Medicine, Ontario, has awarded the Charles Mickle Fellowship for 1943 to Dr. Evarts A. Graham, Bixby professor of surgery at Washington University School of Medicine, St. Louis, surgeon-in-chief at Barnes Hospital, for his discovery of a method of "testing gallbladder functions by the use of certain organic compounds and the diagnosis and treatment of carcinoma of the lung."

Fund for Research in Ophthalmology.—Dr. Edward J. Curran, Kansas City, professor and head of the department of ophthalmology of the medical school of the University of Kansas, has given \$10,000 to the school to provide equipment, material and assistance for research in the department of ophthalmology. The gift was made to the university through the Kansas University Endowment Association, which has been made trustee to administer the fund. Dr. Curran has been a member of the staff of the medical school since 1911.

Personal.—Dr. Kehar Singh Chouke, assistant professor of anatomy, the Medico-Chirurgical College, Graduate School of Medicine, University of Pennsylvania, Philadelphia, is on a six months leave of absence to serve as visiting associate professor of anatomy in Washington University School of Medicine, St. Louis.—Dr. Druery R. Thorn has resigned as medical director of the Kansas City General Hospital.—Dr. Vincent T. Williams, Kansas City, was recently presented with a merit certificate and a gold key in recognition of his service as editor of the Jackson County Medical Society *Weekly Bulletin*.

NEW YORK

Personal.—Dr. William W. Wright, medical superintendent of the Marcy State Hospital, Marcy, ever since its separation from the Utica State Hospital, Utica, in July 1931, recently retired from the state hospital service to enter private practice in neurology and psychiatry in Utica.—Horatio M. Pollock, Ph.D., recently retired from state service after thirty-two years as director of the bureau of statistics of the New York State Department of Mental Hygiene.—Dr. Hiram Charles Goldberg, Albany, has retired as medical examiner and eye specialist in the workmen's compensation division of the state labor department; he held the position for twenty-one years.

New York City

The Harvey Lecture.—Dr. Dickinson W. Richards Jr., associate professor of clinical medicine, Columbia University College of Physicians and Surgeons, will deliver the fifth Harvey Society Lecture of the current series at the New York Academy of Medicine on February 17. His subject will be "The Circulation in Traumatic Shock in Man."

The Hermann Biggs Memorial Lecture.—Dr. Wilbur A. Sawyer, director, International Health Division, Rockefeller Foundation, will deliver the annual Hermann M. Biggs Memorial Lecture at the New York Academy of Medicine under the auspices of the committee on public health relations, April 6. The subject of his lecture will be "International Health."

American and Soviet Blood Banks.—A symposium on American and Soviet blood and plasma banks was conducted at the New York Academy of Medicine, January 26, under the auspices of the New York County Chapter of the American-Soviet Medical Society. Among the speakers were Dr. Charles Richard Drew, assistant professor of surgery, Howard University College of Medicine, Washington, D. C., on "Evolution of the Blood Bank"; Dr. Lester J. Unger, assistant clinical professor of surgery, New York Post-Graduate Medical School and Hospital, Columbia University, "Blood and Plasma Banks in Civilian Practice," and Comdr. Benjamin G. Feen (MC), U. S. Navy, "Blood and Plasma Banks at the Battlefield."

Physician Pleads Guilty in Workmen's Compensation Investigation.—Dr. Theodore R. Freedman, Rockaway Beach, the first person to be indicted in New York County in the investigation of the so-called state compensation racketeering, pleaded guilty on January 7 to a petit larceny count involving him in frauds against the city. Judge Sherman, before whom the plea was entered, released the physician in \$500 bail. He was to appear for sentence on January 28. According to the New York Times Dr. Freedman is liable to a penitentiary term up to three years. Last year Dr. Freedman was restrained from treating workmen's compensation claimants pending the outcome of an indictment for larceny in connection with padding bills for treating these patients (THE JOURNAL, July 10, 1943, p. 757).

Senior Health Officers Appointed.—The New York City Department of Health announces the appointment of five new senior health officers: Dr. Sophie Rabinoff, district health officer at the East Harlem Health Center, will direct the Tremont Health Center and Bronx Borough Office; Dr. Max Bernstein, formerly district health officer of the Lower West Side Health Center in Manhattan, has been named for the Richmond Health Center and Borough Office, Staten Island; Dr. Arthur I. Blau, district health officer at the Red Hook-Gowanus Health Center, Brooklyn, has been named to the Jamaica health center and the Queens Borough office; Dr. Jacob H. Landes, district health officer, has been assigned to the Fort Greene Health Center and Brooklyn Borough office, where he has served as district health officer for the past three years; Dr. Jerome Meyers, health officer of the Mott-Haven Health Center in the Bronx, has been named to the Lower West Side Health Center.

Medicine Honors Philanthropist.—Lucius N. Littauer, retired manufacturer, received the honorary degree of doctor of laws from New York University, January 20, during a brief ceremony held in the psychiatric division of Bellevue Hospital. In a citation accompanying the award, Mr. Littauer was praised for his contribution to the department of psychiatry at New York University College of Medicine and Bellevue Hospital, the creation of a professorship in psychiatry in 1942 now held by Dr. Samuel Bernard Wortis. Dr. Samuel A. Brown, dean emeritus of the college of medicine, stated that Mr. Littauer "has consistently employed each success as a means of giving greater scope to his lifelong propensity by helping others to help themselves." Dr. Edward M. Bernecker, commissioner of hospitals, averred that Mr. Littauer was really the father of the research council of the city department of hospitals "because it was he who in 1935 made the first sub-

stantial donation for the research council and until today he continues as one of its members." Among others attending the ceremony were Harry Starr, secretary of the Littauer Foundation, Alvin S. Johnson, LL.D., director of the New School for Social Research, Dr. Alan Gregg, director of medical sciences of the Rockefeller Foundation, and Dr. Elliott P. Joslin, clinical professor of medicine emeritus, Harvard Medical School, Boston.

Fourteen Point Program Announced by Dr. Berens.—In his inaugural address as president of the Medical Society of the County of New York, Dr. Conrad Berens stated "that the medical profession will resist any attempt to destroy medical responsibility for the care of the sick by the imposition of lay political controls over medical practice." In his address Dr. Berens outlined a fourteen point program to which he said his administration and the county society were pledged:

Establishing a unified system of medical care for the low and moderate income classes of this city, including diagnostic and preventive as well as therapeutic services.

Participation in the development of plans for the equitable distribution of physicians throughout the country.

Thorough study of the educational requirements for medical licensure. Continued study and implementing of voluntary plans for improving the quality and distribution of medical care and adjusting its costs to the needs of the time.

Relationship of the medical profession to the federal government and the state agencies.

Education and ethical control of nonmedical personnel associated with all branches of medicine.

The education, hospital training, practice and certification of Negro physicians.

The development of adequate hospital facilities where needed.

Study of conditions which interfere with the practice of medicine to the detriment of public health.

Study of methods of improving and furthering medical education and the exchange of medical ideas and methods both in the United States and in other countries.

Leadership and closer cooperation with government industry, commerce, labor and social agencies for the expansion and improvement of industrial medical service.

Establishment of a concrete plan for the postwar professional rehabilitation of New York County physicians returning from service.

Thorough housecleaning in the field of workmen's compensation and elsewhere to eliminate undesirable professional practices and investigation of the conditions that have produced these practices with the view to preventing their recurrence.

Establishment of adequate public relations with a view to better public understanding of the aims and accomplishments of American medicine and of our society.

NORTH CAROLINA

Physicians Honored on Birthdays.—The Mecklenburg County Medical Society presented walking canes to Drs. Thomas N. Reid, Matthews, and Thomas M. McCoy, Charlotte, as a feature of its custom to honor members who attain their 70th birthdays. Dr. Reid is 75 years of age and Dr. McCoy is 70.

Medical Symposium.—A medical symposium will be presented at the Washington Duke Hotel, Durham, February 16-17, under the auspices of the staff of Watts Hospital. Among the speakers will be:

Dr. Tinsley R. Harrison, Winston-Salem, The Abuse of Rest as a Therapeutic Measure in Patients with Cardiac Disease.

Dr. Howard H. Bradshaw, Winston-Salem, The Surgical Treatment of Bronchiectasis.

Dr. Kenneth E. Appel, Philadelphia, Psychiatry in the Present World. Lieut. Col. Baldwin H. E. W. Lucke, M. R. C., Renal Lesions of the Crush Syndrome, Burns, etc.

Lieut. Col. Thomas Fitz-Hugh Jr., M. R. C., Cerebral Malaria.

Brig. Gen. Hugh J. Morgan, M. C., A. U. S., Medicine Overseas.

Brig. Gen. James S. Simmons, M. C., U. S. Army (subject not announced).

Clinicopathologic conferences will be presented by Drs. Wiley D. Forbus and Oscar C. E. Hansen-Pruss, Durham, February 16, and by Colonel Lucke and Colonel Fitz-Hugh, February 17.

OHIO

Early Medical Illustrations.—Dr. Max E. Fisch, curator of the Army Medical Library, Cleveland Branch, will discuss "Early Medical Illustrations" at the Cleveland Museum of Art, March 19. The address will be illustrated with slides, selected largely from the rare book collection—incunabula and 16th, 17th and 18th century books—in the Army Medical Library.

Cancer Education Fund Established.—The Amos G. Barron Trust Fund will be set up by the Ohio division of the Women's Field Army, American Society for the Control of Cancer, the nucleus of which will be a \$5,000 bequest of the late Mr. Barron, Cleveland, to the society. The income of the fund will be used for educational publicity on the prevention and cure of cancer.

Million Dollar Bequest Goes to New Foundation.—The Elizabeth Severance Prentiss Foundation will receive 1 million dollars by outright bequest under a special agreement drawn up by Mrs. Prentiss before her death, January 4. The

foundation was created by the late Mrs. Prentiss to promote medical and surgical research and public health and to aid in the support of local hospitals and health institutions and in planning for broader hospitalization and medical care. It was established Jan. 17, 1939 with the provision that its existence remain undisclosed until after her death (*THE JOURNAL*, January 29, p. 314). The gift of 1 million dollars is in addition to the 37 per cent interest in a fund of more than 8 million dollars left by Mrs. Prentiss for public welfare, cultural and educational purposes.

PENNSYLVANIA

James McKeen Cattell Dies.—James McKeen Cattell, Ph.D., widely known psychologist, educator, author and publisher of scientific articles, died January 20 at the Lancaster General Hospital, Lancaster, after a long illness. He was 83 years of age. Dr. Cattell had been editor of *Science* since 1894.

Philadelphia

Dr. Owen Becomes Director of Health for Education Board.—Dr. Hubley R. Owen, since 1940 director of health of Philadelphia, resigned January 1 to become director of the medical division of the board of education of the city.

Dr. Piersol Heads New Program in Physical Medicine.—Dr. George M. Piersol, professor of medicine in the Medico-Chirurgical College, Graduate School of Medicine, University of Pennsylvania, and a member of the Council on Physical Therapy of the American Medical Association, has been appointed director of the new Center for Research and Instruction in Physical Medicine in the graduate school of medicine of the university. The center was established by the National Foundation for Infantile Paralysis when a grant totaling \$150,000 was given for a five year period from Jan. 1, 1944 to Dec. 31, 1948 (*THE JOURNAL*, Dec. 25, 1943, p. 1128). Dr. Piersol will relinquish his private practice to direct the center, one of whose objectives is to explore thoroughly the possibilities of physical means of treatment not only of infantile paralysis but of other diseases as well. Dr. Piersol graduated at the University of Pennsylvania School of Medicine in 1905, becoming a member of the faculty in 1907.

VIRGINIA

Physician Presents Monument to Lynchburg.—Dr. Calie Slaughter Morton, Winter Park, Fla., recently presented a monument to Lynchburg. The work of Brenda Putnam, the three figured monument personifies "Vision," "Fortitude" and "Kindliness" and is a gift to "the Sons and Daughters of Our City of the Hills."

Replicas of Surgical Instruments in Museum.—Personnel of the Eighth Evacuation Hospital, sponsored by the University of Virginia Department of Medicine, Charlottesville, now on duty in southern Italy, recently presented to the medical school a collection of 75 replicas of surgical instruments discovered in the ruins of Pompeii and Herculaneum. They will be on display in the medical library. The originals from which the reproductions were made are on exhibition in the National Museum of Naples. The reproductions, which were made by hand from the metal originally used, usually bronze, are the work of Cavalier Guglielmo Callo, 27 Piazza Dante, Naples.

WEST VIRGINIA

Health Conference.—The annual West Virginia State Health Conference will be held at the Daniel Boone Hotel, Charleston, May 1-2. The program will be in charge of a committee composed of Dr. Albert M. Price, director of the Kanawha County Health Department, Miss Cecelia Robrecht, venereal disease nursing consultant, Charleston, and E. B. Carroll, sanitarian at West Virginia Training Center, Morgantown.

Personal.—Dr. Edgar H. Willard, Berkeley Springs, has been appointed as part time health officer for Morgan County. —Dr. James M. Coram, Beckley, has resigned as director of the Raleigh County Health Department to engage in the practice of medicine at Edwight. —Dr. James C. Hutchinson, Welch, has been appointed acting superintendent of the Welch Emergency Hospital, succeeding Dr. Frank E. LaPrade, who is undergoing treatment at Pinecrest Sanitarium, Beckley. —Dr. Robert D. Wright, former venereal disease consultant attached to the North Carolina State Board of Health, has been assigned as medical officer in charge of the new Kanawha Valley Medical Center at South Charleston. The unit, which was established by act of the 1943 legislature for the treatment of venereal patients, is located in the building formerly used as a NYA training school.

WISCONSIN

Lecture on Nutrition.—Dr. Ragnar Nicolaysen, professor of physiology of nutrition and director of the Institute of Nutrition Research, Oslo, Norway, lectured before the Wisconsin Medical Society January 19 on "Present Day Human Nutritional Problems." Dr. Nicolaysen recently attended the Food Congress of the Allied Nations at Atlantic City.

GENERAL

Cooperative Program for Postwar Hospitalization Needs.—The American Hospital Association has created a postwar planning committee to study postwar hospitalization needs of America. The two year program will be financed initially by grants of \$35,000 each by the Kellogg Foundation and the Commonwealth Fund and \$15,000 by the board of trustees of the American Hospital Association. The study will aim to determine the adequacy of distribution of present hospital facilities and the best method of insuring adequate hospital care for all citizens.

Fellowships Awarded.—The committee on medical education of the New York Academy of Medicine has awarded three of the four Charles Mayer Fellowships to Dr. Harry Goldblatt, professor of experimental pathology, Western Reserve University School of Medicine, Cleveland, the Cancer Research Laboratory of the Mount Sinai Hospital, New York, and John R. Murlin, Ph.D., professor of physiology, University of Rochester, Rochester, N. Y. The four fellowships of \$2,000 for research on "the study of the relationship between precancerous lesions of the mouth, hepatic insufficiency and gastrointestinal disorders" will be held open for further applications until April 15. Applications should be sent to Dr. Mahlon Ashford, secretary of the committee, 2 East 103d Street, New York, not later than April 1.

Society of University Surgeons.—The sixth annual meeting of the Society of University Surgeons will be held at the Vanderbilt University Hospital, Nashville, Tenn., February 10-12. Among the speakers will be:

Dr. James W. Ward, Nashville, The Effect of Rapid Compression Waves on Animals Submerged in Water.

Mr. William F. Meacham, Nashville, Intrathecal Penicillin Therapy of Experimental Staphylococic and Pneumococic Meningitis.

Dr. Alexander Brunschwig, Chicago, Extending Surgical Attack on Cancer of the Colon.

Drs. Frederick A. Collier and Robert W. Buxton, Ann Arbor, Mich., Surgical Treatment of Deep Phlebitis of the Leg of Long Standing.

Drs. William J. German and Bernard S. Brody, New Haven, Conn., Compound Craniocerebral Injuries. Drs. Hilger Perry Jenkins and Joseph Garrett Allen, Chicago, Preparation and Use of Emollient Base Sulfathiazole Ointments.

Dr. Rollin A. Daniel Jr., Nashville, Gunshot Wounds of the Lungs.

Drs. John S. Lockwood, Charles E. Koop and Archibald G. Fletcher Jr., Philadelphia, Clinical Use of Gelatin as a Plasma Substitute.

Standards for Penicillin.—Since it is now the policy of the U. S. Pharmacopeia, with its continuous revision program, to recognize and standardize all important new drugs at the earliest possible date, it is to be expected that the Scope Subcommittee in the near future will accept penicillin as a U. S. P. item and ask the Committee of Revision to provide standards for it. Tentative but unofficial standards have been prepared by the cooperation of the manufacturers of penicillin, working with the Army, Navy, National Research Council, Food and Drug Administration and the War Production Board. All are helping to perfect these standards. At the present time the Food and Drug Administration, under these tentative methods, is checking all production of penicillin manufactured in this country for potency and safety for medicinal use before any lot is used medicinally. All tests as yet are in the development stage. The U. S. P., however, will give standards for penicillin legal status as soon as possible.

Society News.—The tenth annual meeting of the Mississippi Valley Medical Society will be held at the Pere Marquette Hotel, Peoria, Ill., September 27-28. Officers of the society include Drs. Charles Paul White, Kewanee, Ill., president, Grayson L. Carroll, St. Louis, president-elect and Harold Swanberg, Quincy, Ill., secretary-treasurer. —The Association for Research in Ophthalmology will hold a meeting at the Hotel Sherman, Chicago, June 13. Applications for places on the program and all communications should be mailed to Major Brittain F. Payne, M. C., A. U. S., secretary of the association, School of Aviation Medicine, Randolph Field, Texas. —The Society of American Bacteriologists will hold its annual meeting at the Hotel Pennsylvania, New York, May 3-5, under the presidency of Rebecca C. Lancefield, Ph.D., New York. —The American Association of Cereal Chemists will hold its annual meeting at the Nicollet Hotel, Minneapolis, May 23-25.

The Devereux Award.—The first presentation of the Devereux Award of the American Psychiatric Association will take place at the meeting of the organization in Philadelphia in May. The establishment of the award was announced at the Detroit meeting May 12, 1943. The award is a competitive one, the subject of the competing essays to be on any phase of child psychiatry, including laboratory studies, psychologic analyses and approaches, biometrics, genetics, a clinical description and the therapeutics. To encourage research among the younger workers the contestants should be limited to persons having less than fifteen years of experience in the field, and no person having the rank of full professor or who is the head of an institution will be considered as a competitor for the prize. Except for these restrictions, the field is open to any one who has direct and personal experience in the field of child psychiatry. All papers must be submitted on or before March 1. They must be sealed and mailed to the American Psychiatric Association, Room 924, 9 Rockefeller Plaza, New York. All papers will become the property of the Devereux Schools, which established the award through the American Psychiatric Association, and may be used in any manner that they see fit. At the annual meeting in Philadelphia, May 15-18, the American Psychiatric Association will observe its 100th anniversary.

Meetings of Anesthetists.—The American Society of Anesthetists will be addressed at a meeting in New York, February 10, by Drs. Meyer Saklad, Providence, R. I., Noel A. Gillespie, Madison, Wis., and Emery A. Rovenstine, New York, on "Inhalation Therapy"; Leo V. Hand, Boston, "Subarachnoid Ammonium Sulfate Therapy," and Samuel A. Guttman, Philadelphia, "Spinal Cord Syndrome Following Intrathecal Ammonium Sulfate and Procaine—A Case Report with Autopsy Findings." At a meeting in Chicago February 18 the society will be addressed, among others, by Dr. Rovenstine on "The Present Status of Anesthesia" and Dr. Ralph M. Waters, Madison, "The Future Status of Anesthesia." Other speakers will include:

- Dr. Hugh O. Brown, Chicago, Report of 200 Continuous Caudal Procedures.
- Dr. Anderson C. Hilding, Duluth, Minn., The Relation of the Ciliary Mechanism to Postoperative Atelectasis and Certain Other Pathologic States in the Lower Respiratory Tract.
- Lieut. W. Allen Conroy, M. C., A. U. S., The Combination of Pentothal Sodium and Nitrous Oxide for Anesthesia.
- Dr. John S. Lundy, Rochester, Minn., The Management of Shock—The Problem for the Anesthetist.
- Dr. Paul H. Holinger, Chicago, Endoscopic Cinematography of the Larynx, Tracheobronchial Tree.
- Dr. Raymond B. Allen, Chicago, The Anesthetic Actions of Anesthetic Agents.

The program will also include a series of morning clinical meetings and round table discussions.

Diagnostic and Registry Center for Fungous Diseases of Man.—The American Foundation of Tropical Medicine has given a grant to the group of workers studying fungous infections at Duke University, Durham, N. C., to set up a diagnostic and registry center for fungous diseases of man. The service will include identification of fungi already isolated from patients suspected of having fungous disease and pathologic study and registry of biopsy and necropsy materials from patients suspected of having fungous infection. This is not to conflict with the diagnostic and registry services maintained by the several branches of the armed forces. A complete set of cultures of pathogenic fungi will be sent on request to any medical school for use in teaching courses in tropical medicine. To guarantee arrival of the fungi in proper state for study, it is necessary that requests for this material be sent at least one month prior to the time at which the cultures will be necessary for demonstration. By special arrangement, serologic tests will be done in certain of the fungous infections and vaccines for skin testing and therapeutic use in certain of the fungous infections will be sent on request. Specimens for pathologic study should be sent to Dr. Roger D. Baker, Duke Hospital, Durham, N. C. All other requests will be handled through the office of Dr. David T. Smith, Duke Hospital. Dr. Baker, who is associate professor of pathology at Duke University School of Medicine, announced that he would be pleased to receive any human pathology material showing disease due to fungi which have been removed by biopsy or at autopsy, in the form of microscopic sections, paraffin blocks or fixed tissues. Whenever possible, cultures of the fungus should be sent also as well as clinical data and photographs. Dr. Baker states that since his chief interest is the morbid anatomy and histopathology of fungous diseases he should like such material in the absence of accessory material. A definite etiologic diagnosis may be impossible in the absence of culture, he says. A report of his studies will be sent without charge to the contributor but rapidity of report cannot be guaranteed.

FOREIGN

Famine in Honan Province.—The school of medicine and dentistry of West China Union University, Chengtu, sent a medical unit of twenty-six doctors, dentists and nurses into Honan Province to assist in the famine there. The unit members traveled from Southwest China to Honan Province in two charcoal burning ambulances of the Friends' Ambulance Unit. Two public health centers were set up in Loyang under the direction of Bishop Thomas M. Megan of the Catholic Mission of Loyang, and a third unit was established in Changchow, the seat of some of the worst Honan famine suffering.

Rickettsia and Virus Laboratory Organized.—The development of a rickettsia and virus laboratory in China by the Chinese National Health Administration is going forward with the cooperation of the American Bureau for Medical Aid to China and United China Relief. Dr. Chen-Hsiang Huang, instructor in medicine and virus research, Columbia University College of Physicians and Surgeons, and fellow of the Rockefeller Institute for Medical Research, is en route to China to direct the work as head of the department of experimental medicine in the National Institute of Health. According to a release from United China Relief, at the present time there is no medical school or institution in China equipped to carry on virus research, and the rickettsia and virus laboratory will be the first of its kind in that country.

Great Britain's Health.—The general health of the British nation has continued good under the strains of war and, in some respects, is even better than in peacetime, according to a recent report which covers the year 1942. The report states that the birth rate was 15.8, the highest since 1931. The infant mortality rate was 49 per thousand live births compared with 59 in 1941, the first rate below 50 ever recorded for these statistics. The maternal mortality rate was 2.47 per thousand total births compared with 2.76 in 1941. The death for female civilians was 6.84 per thousand, 8 per cent better than any previous year, while the lowest rate for civilian males, 9.52, was recorded. The continued good health during wartime can be attributed to an adequate program of nutrition, it was stated. Tests of 4,500 persons of different ages and occupations showed evidence of deficiency disease in only 13 adults and adolescents and in only 2 school children. This study was supervised by Dr. Virgil P. W. Sydenstricker, professor of medicine, University of Georgia School of Medicine, Augusta, whose services were made available to the Ministry of Health through the International Health Division of the Rockefeller Foundation. Two surveys of the diet and planning of meals among working class families in specially chosen areas showed that about 10 per cent of the 600 persons examined were badly nourished, a result caused not because an adequate diet was unavailable but because years of poverty and unemployment had discouraged many people from maintaining a decent standard of house-keeping and cooking. A survey covering 1,500 families from North Scotland to the South Thames, made by Sir John Boyd Orr, revealed that, notwithstanding overcrowding and deterioration of medical services due to call-up of doctors, the health of wage earning classes is better than before the war. The report emphasizes the increase in the incidence of respiratory tuberculosis and venereal disease, although the total number of deaths from all kinds of tuberculosis was 25,547, about 2,500 less than in 1940, 3,000 less than in 1941 and about the same as in the last prewar year 1938, which was the lowest total on record. The number of civilian and service patients attending syphilis treatment centers for the first time represented an increase of 29.6 as compared with 1941; the rise of 1941 over increase of 1940 was 40 per cent. The increase in new syphilitic infections since the beginning of the war now amounts to 120 per cent, it was stated. Figures of civilian infections of gonorrhea are not available, but, taking service statistics as a guide, it is estimated that during 1942 new infections of gonorrhea have been from six to seven times as many as those of syphilis. In November 1942 the government inaugurated compulsory treatment for those who refused to take voluntary care.

CORRECTION

Membership of Dr. Lowe.—The obituary of Dr. Edwin H. Lowe, Maryville, Tenn., should have contained the fact that he was a member of the Tennessee State Medical Association. In error, THE JOURNAL, January 15, page 186, reported that Dr. Lowe was a member of the Medical Society of the State of Pennsylvania.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Jan. 1, 1944.

The Education and Training of Blinded Soldiers in German Prison Camps

The education and training of men in German prison camps have been described in a previous letter, and something may now be said about the special case of blinded prisoners. When the initial shock of their catastrophe had been overcome, the men began to realize that a long period of education by new methods would be necessary for them to be able to take their place beside seeing workers. At least the beginning of their long reeducation, it was felt, might be completed during their prison life. Ultimately, owing to the efforts of the Young Men's Christian Association, the blinded men were collected in one center. The German authorities were sympathetic toward this work. A braille school was started. The braille alphabet was picked out on a piece of cardboard with matches and pins. Then material and assistance came from St. Dunstan's, the British institution for blinded service men established during the war of 1914-1918. Three volunteer teachers were obtained for typewriting, music and commercial correspondence. One was an Australian Air Force sergeant, another a New Zealand sergeant of the Army Medical Corps and another a corporal. The untiring work and encouragement of these teachers produced constructive results. Proficiency was reached in reading and writing braille and in typewriting. The curriculum of the braille school was then enlarged to include braille shorthand, elementary English, geography and science, elementary economics and commercial correspondence. For recreation, a band of sixteen members was formed. The majority had never played musical instrument before, but after months of hard practice free concerts were given in the camp. By their persistent determination the men reached a stage of proficiency in all the fundamentals of education necessary for a blind man, and they will be able to start their final training at St. Dunstan's on returning to England.

Government Commission to Investigate the Birth Rate

The government has decided to set up a commission to investigate the birth rate and trends of population. The chairman will be Lord Simon, the lord chancellor. The specific functions of the commission are to examine the facts relating to present trends of population in Great Britain, to investigate the causes of these trends and consider the probable consequences; to consider what measures, if any, should be taken in the national interest to influence the future trend of population and to make recommendations. A number of inquiries of a technical kind are to be undertaken immediately.

In an editorial the *Times* declares that no subject could be of greater importance or more worthy of official attention and national action. Britain, in common with all western Europe and indeed with most white peoples of the world, has reached a turning point of history. The great expansion of the white races, which began some three hundred years ago and reached its climax in the 19th century, is, on all present evidence, drawing to an end. The continuance of trends which have now prevailed for well over a generation, through prosperity and depression and peace and war alike, will halt the growth of population in Europe within the next thirty years. Within the same period, population growth may be expected to cease in Australia and New Zealand. Canada and the United States are not likely to lag far behind. But the Soviet Union, which is demographically in the position of Britain one hundred years ago, can expect a rapid expansion of numbers throughout the

coming generation. It may be conceded that a stationary population in Europe, the British dominions and North America would bring many advantages. The multiplication of the human race must one day come to a halt, and the halt may present an opportunity for great improvement in economic and social well-being. Yet crucial problems remain. The expansion of the white peoples was achieved by a great reduction in death rates. This was followed, within living memory, in most countries, by a great reduction of the birth rate, which is bringing the increase of population to an end. But in western Europe the decline of fertility has gone well beyond the point necessary for maintenance of the population. A bad result of the decline of the birth rate in this country is a steady rise in the average age of the population. In less than thirty years the proportion of persons of pensionable age is likely to increase from 12 per cent today to 21 per cent. The proportion of children under 15 may fall from 21 to 16 per cent. Thus the burden of supporting the aged and the infirm will increase.

Reform in the Training of Nurses

Far reaching recommendations for nursing education are made in the report of the Reconstruction Committee of the Royal College of Nursing, presented by the chairman, Lord Horder, to the minister of health. An important proposal is that greater emphasis should be laid on the status of the student nurse. In the past she has been regarded largely as "cheap labor" and not as a professional trainee. In a foreword to the report Lord Horder states that the training of the nurse, in spite of minor improvements, is still too haphazard and is maintained under handicaps with which no true educational movement should be faced. It is suggested that instead of being paid during training the student nurse should pay for her training—a step which Canada took many years ago with most successful results. This would put her on the same footing as students training for other professions. If necessary to ensure that no suitable candidate should be lost to the profession through inability to pay the fee, it is recommended that free places with maintenance grants should be available. The nation should make a financial contribution to its nurses, as it does to the education of teachers, physicians and other professional workers.

The committee recommends that grants be made from national funds to all recognized training hospitals, because of the national importance of the training of nurses, and suggests the setting of standards below which no training program can fall without forfeiting its status. Boards of hospitals must regard themselves as educators; training hospitals should adopt a wider basic training on the "block system," whereby the student has alternate periods of practical and theoretical instruction. Thus the strain of lectures taken in off duty time or at the end of a busy day or night might be avoided.

Industrial Rehabilitation Center

The war has of course given rise to a good deal of disablement in the civil population as well as in the fighting forces. The minister of health has established at Egham, Surrey, a residential center for the purpose of assisting the early return to work of men who, after receiving inpatient treatment in the hospital or after completion of other medical treatment, need a period of reconditioning in order to make them fit to resume full time employment in their usual occupation or to take up a full time course of vocational training for another occupation. The objects of the center are, first, to restore confidence and mental and physical fitness by exercises and healthy indoor and outdoor occupations and, second, to test suitability for a particular occupation or course of training. The courses are intended primarily for men between the ages of 18 and 50, though those above or below these limits may occasionally be admitted when vacancies occur. Foreigners and dominion nationals are admitted provided they satisfy certain conditions.

German and Japanese Maltreatment of Women

The German and Japanese maltreatment of women under their rule is described in reports of conditions in occupied countries issued by the Inter-Allied Information Committee. Great care has been taken and much restraint exercised so that the record, if anything, is an understatement. Enemy bestiality reaches its lowest depths, perhaps, in Russia, Poland and China. In Poland there has been wholesale seizure of girls and young women to be sent to brothels for soldiers. Executions are an essential feature of the oppression. It is estimated that in Czechoslovakia 170 to 180 women lost their lives for alleged political offenses between May 28 and July 3, 1943. In Crete many civilians were executed for the alleged offense of "unlawfully" taking part in the fighting. Their wives, children and other relatives were not only forced to be present at the execution and to dig the graves but they also had the executioners billeted on them and were compelled to cook and keep house for them.

BRAZIL

(From Our Regular Correspondent)

Dec. 30, 1943.

Vital Statistics of the Brazilian Cities

We are yet far from an approximate idea of the vital statistics situation of the whole population of Brazil, as the enormous size of the country, the lack of facilities of communication and the relative backwardness of several sections represent important difficulties to be overcome. For a few years the National Department of Health has been making great efforts to stimulate the development of state and local public health organizations, one of the functions of which is the registration and collection of vital statistics. Statistical information for the principal cities of the country, which, unlike those in the United States are as a rule the capitals of the twenty states, is beginning to be compiled on a basis making it feasible now to examine the main facts which they present. With the exception of a half dozen capitals, all the other fourteen are cities of a hundred thousand or more population. Six of them have more than 200,000 population: Belém, 209,000, Belo-Horizonte 215,000, Porto Alegre 280,000, Salvador 295,000, Recife 355,000 and São Paulo 1,320,000. Adding the population of these twenty cities to that of the capital of the country (Rio de Janeiro, 1,840,000 inhabitants), we have an aggregate of 5,670,000 population the demographic situation of which may be studied through the statistical returns for 1942, now available.

For this aggregate of population, which represents about 13 per cent of the number of inhabitants of the whole country, 161,028 births have been registered during the year 1942, which corresponds to the annual birth rate of 28.4 per thousand of population. Similarly, during the same period, 124,173 deaths have been registered, corresponding to the annual death rate of 21.9 per thousand. There is a significant difference between the annual death rate for the group of northern, tropical cities of Brazil, and for the southern, subtropical, and more advanced cities: 24.3 per thousand for the former and 16.5 per thousand for the latter. The diseases of the digestive system formed by far the most important group of causes of death, with a specific crude death rate of 509.4 per hundred thousand, or 23.3 per cent of the total mortality. For the northern cities the death rate was 695.3 per hundred thousand and for the southern cities 313.6 per hundred thousand. Tuberculosis was the second most important cause of death, with the annual death rate of 280.3 per hundred thousand for the whole group of cities, or 12.8 per cent of the total mortality. There was practically no difference between the death rate from tuberculosis for the northern and for the southern cities. Malaria was an important cause of

death, as the annual death rate for the whole group of cities was 69.8 per hundred thousand, or 3.2 per cent of the total mortality. There was a striking difference between the incidence of this disease in the northern and the southern cities: 108.5 deaths per hundred thousand for the former and only 16.5 for the latter. Dysentery, measles, typhoid and whooping cough had a relatively high incidence, as the annual death rates from these causes were respectively 21.1, 21.1, 15.7 and 12.0 per hundred thousand, diphtheria having a relatively low incidence, as the death rate was 6.3 per hundred thousand, with only a slight difference between the several cities. Cancer was the cause of 2,960 deaths, corresponding to the annual death rate of 52.2 per hundred thousand. As reported in *THE JOURNAL*, June 12, 1943, cancer mortality is much higher in the southern than in the northern cities of Brazil, for 1942 the death rates being respectively 73.1 and 39.4 per hundred thousand. The death rates for the diseases of the circulatory, the respiratory and the nervous systems respectively were 233.0, 149.1 and 68.1 per hundred thousand. For the whole group of cities the maternal death rate was 10.3 per hundred thousand, showing a large range of variation, from 3.8 for progressive São Paulo in southern Brazil to 17.9 for backward Manaus in the equatorial Amazon valley.

Adrenogenital Syndrome in Adrenal Carcinoma

Dr. Salgado of Belo-Horizonte reported a rare case of adrenogenital syndrome caused by adrenal carcinoma in a woman. The diagnosis was made by air insufflation of the perirenal region. The clinical features were impressive: hirsutism, muscular development, acne, hypertrophy of the clitoris, amenorrhea, atrophy of the uterus and hypertension. The tumor, having the size of an infant's head and weighing 600 Gm., was excised through an incision in the lumbar region. Pathologic examination revealed adrenal carcinoma, microcystic degeneration of both ovaries and cystic endometrium at rest. Using high doses of estrogens, 1,000,000 international units in sixty days, it was possible to release the inhibitory effect of the tumor on the endometrium. Tumors of the adrenal cortex can be successfully removed, the author says, and the operation is often life saving.

Marriages

LEO E. PETERS, Little Rock, Ark., to Miss Ruby Christine Irwin of DeQuincy, La., at Shreveport, La., January 22.

ARTHUR H. ULMER JR., Toledo, Ohio, to Miss Betty Key of Ferndale, Mich., in Ann Arbor, Mich., December 30.

JOSEPH B. LONGINO, Sulphur Springs, Texas, to Miss Joan Schultz of Grand Rapids, Mich., recently.

GEORGE GORDON CULBRETH, New Bern, N. C., to Miss Mary Fern Coble of Durham, December 21.

GERHARD HERMAN BAUER to Miss Dorothy Wiedman, both of Ann Arbor, Mich., January 1.

HARRISON F. HARBACH, Gettysburg, Pa., to Miss Suzanne Heiges of Harrisburg, January 1.

JOHN ROBERT EGAN, Pierre, S. D., to Miss Marjorie Sampson of Essex, Conn., January 18.

VINCENT EDWARD ROMANO, Newark, N. J., to Miss Mary Spann at Far Hills, January 5.

HUGH ARCHIE MATTHEWS to Miss Ruth Burch, both of Canton, N. C., December 28.

EVERETT W. GAUNT, Indianapolis, to Miss Betty Lou Brown of Franklin, Ind., January 2.

RICHARD LEWIS BODKIN to Miss Marie Kathleen Hamann, both of Brooklyn, January 8.

GERALD E. FISHER, Lebanon, Ind., to Miss Bonlyn Stone of Indianapolis, November 7.

JACKSON E. KRESS to Miss Kathryn Norton, both of Sayre, Pa., December 18.

JULIUS L. ROGOFF to Miss Stella Faw, both of New York, recently.

Deaths

Harry Lorenzo Gilchrist * Major General, U. S. Army, retired, Washington, D. C.; Western Reserve University Medical Department, Cleveland, 1896; an honor graduate and medalist of the Army Medical School in 1903; a contract surgeon with the U. S. Army from 1898 to 1900; entered the medical corps of the U. S. Army as an assistant surgeon in 1900; was made a captain in 1905, a major in 1909, a lieutenant colonel in 1917, colonel in 1926 and major general in 1929, when he became chief of the chemical warfare service; retired from the latter position in 1933 and from active duty in the army Jan. 31, 1934; formerly head of the medical research laboratory, chemical warfare service, Edgewood Arsenal, Md., and later chief of the medical research division in the office of the chief, chemical warfare service, in Washington, D. C.; health officer at Manila in 1900; organized a field hospital following the San Francisco earthquake in 1906; in 1917 was placed in command of Base Hospital number 4, organized from Western Reserve University, the first unit of the American troops to go to Europe; as British General Hospital number 9 at the front, the unit was commanded by him until December 1917, when he was made medical director of the chemical warfare service with the American Expeditionary Forces; in 1919 in command of the American Typhus Relief Expedition to Poland, where he remained for two years during the war of Poland with the Bolsheviks; one of four officers of the medical corps who had been assigned to military duty as a general officer and chief of branches outside the medical department; fellow of the American College of Surgeons; president of the Association of Military Surgeons of the United States, 1933-1934; a member of the International Medical Club, Army and Navy Club of Washington; an honorary professor of Polish Army Medical School and an honorary member of the Mexican Association of Military Surgeons; awarded the Distinguished Service Medal, Purple Heart, General Service Medal (Great Britain) Legion of Honor and Médaille d'Honneur Epidemics (France), Cross of the Valiant and Commander Order of Polonia Restituta (Poland), Order of Star of Abdon Calatrón (Ecuador), Spanish-American War Decoration (Cuba) campaign medals for the Spanish-American War, the Philippines, Cuba, Mexican Border and World War I; cited for special orders by Field Marshal Sir Douglas Haig and by General Pershing for "especially meritorious service with chemical warfare service"; editor of the *Military Surgeon* from 1934 to 1940; died in the Walter Reed General Hospital December 26, aged 73, of arteriosclerosis.

Paul Keller * West Allenhurst, N. J.; Jefferson Medical College of Philadelphia, 1917; senior medical officer in the navy and honorably cited for service during World War I; for many years executive director of the Newark Beth Israel Hospital; served on the Emergency Relief Administration of the New Jersey Administrative Council in 1934 and in the same year was named . . . of the Bankers Indemnity Company of New Jersey; in 1935 named director of the Newark Bureau of Industrial Hygiene; when the Association of Industrial Physicians and Surgeons of New Jersey was organized in 1938, was chosen acting secretary; instrumental in organizing the Essex County Hospital Council; served as staff surgeon for the Pennsylvania Railroad; member of the executive committee of the University of Newark; past president of the New Jersey Hospital Association; vice president and medical director of Associated Hospital Service of New York; died December 22, aged 52, of heart disease.

Karlton Goodsell Percy, Boston; Harvard Medical School, Boston, 1911; specialist certified by the American Board of Pediatrics, Inc.; member of the Massachusetts Medical Society, American Academy of Pediatrics and the New England Pediatric Society; formerly assistant in pediatrics at his alma mater; consultant in pediatrics at the Charles Choate Memorial Hospital, Woburn, Chelsea Memorial Hospital, Chelsea, Symmes Arlington Hospital, Arlington, and the Winthrop Community Hospital, Winthrop; was instantly killed by the accidental discharge of his shotgun when he stumbled over a wire, November 15, aged 57.

Samuel Herbert Geist * New York; Columbia University College of Physicians and Surgeons, New York, 1908; clinical professor of gynecology at his alma mater; specialist certified by the American Board of Obstetrics and Gynecology, Inc.; member of the American Gynecological Society; fellow past president of the New York Obstetrical Society; served as a captain

in the medical corps of the U. S. Army with the American Expeditionary Forces in France; on the staff of the Mount Sinai Hospital; author of "Ovarian Tumors"; died December 14, aged 58, of hypertension.

Max Biesenthal * Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1904; specialist certified by the American Board of Internal Medicine; formerly a director of the National Tuberculosis Association and a member of the executive board of the Chicago Tuberculosis Institute; served as president of the Mississippi Conference on Tuberculosis; formerly attending physician, Cook County Hospital; on the staff of the Michael Reese Hospital; medical director of the Winfield Sanatorium, Winfield, Ill.; died January 20, aged 61, of coronary thrombosis.

Frank West Allen, Houston, Texas; Fort Worth School of Medicine, Medical Department of Fort Worth University, 1900; member of the State Medical Association of Texas; died in the Heights Clinic-Hospital recently, aged 69, of cardiac asthma.

Napoleon J. Atkinson, Greenville, Texas; Meharry Medical College, Nashville, Tenn., 1895; a member of the chamber of commerce; died in Texarkana November 30, aged 70.

Tracy Wentworth Blachley * Chicago; Northwestern University Medical School, Chicago, 1907; served in the medical corps of the U. S. Army during World War I; member of the staff, Illinois Masonic Hospital; died December 21, aged 59, of Hodgkin's disease.

James Maurice Bowman, Columbus, Ohio; Ohio State University College of Medicine, Columbus, 1916; served during World War I; on the staff of the Grant Hospital, where he died November 21, aged 65.

Thomas Franklin Branson, Rosemont, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1892; member of the Medical Society of the State of Pennsylvania; served as physician in chief for the Bryn Mawr College and Shipley School, Bryn Mawr; on the staff of the Bryn Mawr Hospital; died in Philadelphia December 8, aged 74, of arteriosclerosis.

Clement W. K. Briggs, Chicago; National Medical University, Chicago, 1906; on the staffs of the Cuneo Hospital and the Columbus Hospital, where he died December 22, aged 62, of carcinoma of the lung.

Thomas Oscar Brown, Osage City, Kan.; University Medical College of Kansas City, Mo., 1897; for many years owner of the Brown Hospital; died in the University of Kansas Hospitals, Kansas City, November 12, aged 74.

Oliver Franklin Carr, Clarksdale, Miss.; University of the South Medical Department, Sewanee, Tenn., 1903; member of the Mississippi State Medical Association; formerly superintendent of the State School for the Blind, Jackson; died in the Baptist Memorial Hospital, Memphis, Tenn., December 4, aged 63.

Jay Russell Coffey * Portland, Ore.; University of Oregon Medical School, Portland, 1923; served in France during World War I; died suddenly November 29, aged 49.

William Walter Cummings, Providence, R. I.; Johns Hopkins University School of Medicine, Baltimore, 1916; member of the Rhode Island Medical Society; served as a captain in the medical corps of the U. S. Army during World War I; on the staffs of the Homeopathic and the Charles V. Chapin hospitals; died December 4, aged 53, of heart disease.

Moses Green Daly, Little Rock, Ark.; University of Arkansas School of Medicine, Little Rock, 1912; member of the Arkansas Medical Society; on the staffs of the Baptist State Hospital, University Hospital and St. Vincent's Infirmary; died December 12, aged 64, of pneumonia.

John William Daugherty, Chillicothe, Ill.; Rush Medical College, Chicago, 1900; member of the Illinois State Medical Society; died in St. Francis Hospital, Peoria, November 30, aged 69, of carcinoma of the cecum.

E. Ellsworth Dell * Sand Lake, Mich.; Illinois Medical College, Chicago, 1900; served as a member of the village council and the school board; on the staff of the Blodgett Memorial Hospital, Grand Rapids; instantly killed December 18, aged 72, in an automobile accident.

Clarence Dillard Jr., Goldsboro, N. C.; University of West Tennessee College of Medicine and Surgery, Memphis, 1912; died December 19, aged 56, of cardiac decompensation.

Felix Albert Dolan, Sheridan, Wyo.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1900; member of the Wyoming State

Medical Society; formerly served as county health officer; on the staff of the Sheridan County Memorial Hospital, where he died December 4, aged 70, of coronary thrombosis.

Edmund LeRoy Dow, Palm Beach, Fla.; College of Physicians and Surgeons, New York, 1895; died December 1, aged 73.

Lewis Walton Dudley, Milwaukee; Northwestern University Medical School, Chicago, 1893; served as a captain in the medical corps of the U. S. Army during World War I; formerly superintendent of the Wisconsin State Sanatorium, Statesan; died in St. Agnes Hospital, Fond du Lac, Wis., December 3, aged 76, of carcinoma of the colon.

Benjamin Franklin Elliott, Moundville, Ala.; University of Alabama School of Medicine, 1912; member of the Medical Association of the State of Alabama; served on the staff of the City Hospital, Mobile; died December 1, aged 57.

Joseph Yancy Freeman, Lafayette, Tenn.; University of Tennessee Medical Department, Nashville, 1910; member of the Tennessee State Medical Association; also a minister; died December 20, aged 71, of coronary occlusion.

Cornelius Edward Geary ♂ Fitchburg, Mass.; Harvard Medical School, Boston, 1907; died December 6, aged 63.

Francis Otto Geisler ♂ Isabella, Tenn.; University of Nashville Medical Department, 1908; secretary and treasurer of the Polk County Medical Society for many years; died in Chattanooga November 18, aged 62.

John N. George, Centerville, Ark.; Memphis (Tenn.) Hospital Medical College, 1899; formerly served as county judge, sheriff and state senator; died in a Russellville hospital November 4, aged 65.

Herbert F. Gillette, Woodbury, Conn.; College of Physicians and Surgeons, Buffalo, 1882; for many years a ship surgeon, and surgeon for the Erie Railroad; died in the Danbury Hospital, Danbury, December 21, aged 87, of heart disease.

Israel Grushlaw, New York; University of Pennsylvania Department of Medicine, Philadelphia, 1899; member of the Medical Society of the State of New York and the American Academy of Ophthalmology and Otolaryngology; on the staff of the Lebanon Hospital; died December 9, aged 67, of heart disease.

Joseph Edward Hallisey, Boston; Tufts College Medical School, Boston, 1908; professor of clinical medicine at his alma mater; served as physician in chief of the first medical service and chief of the cardiac clinic, Boston City Hospital; past president of the Boston City Hospital Alumni Association; died November 18, aged 60, of cardiac decompensation due to arteriosclerotic heart disease.

John Henry Harms, Newton, Kan.; University Medical College of Kansas City, Mo., 1892; member of the Oklahoma State Medical Association; died November 25, aged 84.

James Vance Harsha, Houston, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1896; served during World War I; honorary member of the medical staff of the Canonsburg General Hospital, Canonsburg; died in the Veterans Administration Facility, Aspinwall, December 10, aged 72, of bronchopneumonia.

Arthur John Hart ♂ Major, U. S. Army, retired, Jersey City, N. J.; Georgetown University School of Medicine, Washington, D. C., 1936; also a dentist; entered the U. S. Army in 1910; commissioned a first lieutenant in the dental corps in June 1917 and promoted to major in October 1917; retired in June 1920 for disability in line of duty; resident in radiology at the Medical Center of Jersey City, where he died December 22, aged 55, of hypertensive heart disease and bronchopneumonia.

Harry Fairbanks Hartwell ♂ Weston, Mass.; Harvard Medical School, Boston, 1898; for many years instructor in surgery at his alma mater; served with the first Harvard unit in the British Medical Corps during World War I; formerly surgical pathologist for the Massachusetts General Hospital; died December 7, aged 69.

William D. Henderson, Hamilton, Ill.; Starling Medical College, Columbus, 1878; died December 16, aged 80.

Henry Hertzler, Jenners, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1901; died December 4, aged 76.

Hinson Duncan Hicks ♂ Clinton, Tenn.; University of Louisville (Ky.) Medical Department, 1900; served as a member of the city board of education and a member of the board of pension examiners; died suddenly, December 6, aged 67.

Andrew Jack Hoefer, San Diego, Calif.; University of Kansas School of Medicine, Kansas City, 1932; member of

the California Medical Association; died in the Mercy Hospital December 3, aged 43, of cirrhosis of the liver.

Adolph F. Hofkin, Philadelphia; Medico-Chirurgical College of Philadelphia, 1900; died December 12, aged 68.

James W. Holmes, West Point, Miss.; Meharry Medical College, Nashville, Tenn., 1892; died recently, aged 86.

Harry Walter Houf Sr. ♂ Minturn, Colo.; University of Missouri School of Medicine, Columbia, 1908; died December 3, aged 68, of coronary thrombosis.

Myrtle Belle Hudson, Pacific Grove, Calif.; American Medical Missionary College, Battle Creek, Mich., and Chicago, 1907; died November 8, aged 78.

Frank Hasson Ikirt, East Liverpool, Ohio; Baltimore Medical College, 1907; died in the Ohio Valley General Hospital, Wheeling, December 6, aged 69, of heart disease.

Roland Jessop, Oil City, Pa.; Jefferson Medical College of Philadelphia, 1892; member of the Medical Society of the State of Pennsylvania; served as secretary and president of the York County Medical Society and the York Medical Club; for two years health officer of York; chairman of the crippled children's committee of the Rotary Club; served as chief of the orthopedic department, York Hospital; died November 30, aged 73, of diabetes mellitus and arteriosclerosis.

Edward Healey Kelly, Scranton, Pa.; Medico-Chirurgical College of Philadelphia, 1909; member of the Medical Society of the State of Pennsylvania; died December 9, aged 67, of coronary thrombosis.

Edward Anthony Kennedy ♂ Pittsfield, Mass.; University of Vermont College of Medicine, Burlington, 1905; on the staffs of St. Luke's Hospital, Hillcrest Hospital and the House of Mercy; died December 14, aged 63, of coronary occlusion.

Cleve Edwin Kindall ♂ Los Angeles; University of Colorado School of Medicine, Denver, 1911; served during World War I; at one time affiliated with the U. S. Public Health Service and the U. S. Bureau of Mines; for many years district surgeon for the Standard Oil Company of California; member of the medical staff of St. Vincent's Hospital, where he died December 11, aged 55, of Hodgkin's disease.

Oren B. C. Kinney, Cody, Wyo.; University of Vermont College of Medicine, Burlington, 1890; member of the Wyoming State Medical Society; died November 10, aged 77.

George Wallace Kirk ♂ Shepherdsville, Ky.; Hospital College of Medicine, Louisville, 1883; served as a member of the local board of health; died December 6, aged 82.

Henry John Kohlmann, Brooklyn; Long Island College Hospital, Brooklyn, 1907; member of the Medical Society of the State of New York; on the staffs of the Cumberland, Swedish, Mather Memorial and Methodist hospitals; member of the Selective Service; died December 18, aged 61, of coronary heart disease.

John William Lane, Boston; Harvard Medical School, Boston, 1903; member of the Massachusetts Medical Society; assistant demonstrator of anatomy at the Tufts College Medical School from 1905 to 1908; assistant in surgery, courses for graduates, Harvard Medical School, from Sept. 1, 1912 to Sept. 1, 1915; served during World War I; served on the staffs of St. Margaret's, St. Elizabeth's and the Boston City hospitals; died December 3, aged 66, of heart disease.

Henry Wilson Lattin, Albion, N. Y.; University of Buffalo School of Medicine, 1895; died December 23, aged 75.

Charley S. Laws, Texarkana, Ark.; Gate City Medical College, Texarkana, 1905; member of the Arkansas Medical Society; died in a local hospital November 24, aged 66.

Alfred Leighton Marks, Spokane, Wash.; Trinity Medical College, Toronto, Ont., Canada, 1900; died in December, aged 63.

Joseph Ray Horatio McDaniel ♂ East Fultonham, Ohio; Ohio Medical University, Columbus, 1902; at one time vice president of the Muskingum County Academy of Medicine; formerly county coroner; died December 14, aged 63.

Clarence Willson McElhane, Greenville, Pa.; Western Reserve University Medical Department, Cleveland, 1893; member of the Medical Society of the State of Pennsylvania; fellow of the American College of Surgeons; on the staff of the Greenville Hospital; died November 25, aged 74, of coronary thrombosis.

James William McLaughlin, Rossville, Ill.; Ensworth Medical College, St. Joseph, Mo., 1893; died in St. Elizabeth Hospital, Danville, December 6, aged 76, of carcinoma of the esophagus.

Joseph Franklin McNew, Farmersville, Texas; Dallas Medical College, 1904; veteran of the Spanish-American War; died in Dallas November 23, aged 67, of cerebral hemorrhage.

William Henry Mick, Cleveland; John A. Creighton Medical College, Omaha, 1903; member of the American Roentgen Ray Society; served with the Cornell evacuation hospital unit in France during World War I; on the staff of the Huron Road Hospital, East Cleveland; died December 9, aged 66, of coronary thrombosis.

Edwin A. Milligan, Scottsville, Ark. (licensed in Arkansas in 1903); also a minister; died in a Little Rock hospital November 24, aged 78.

John Edward Morgan, Oskaloosa, Iowa; Keokuk Medical College, 1892; served during World War I; designated examiner for the Veterans Administration for many years; died December 6, aged 78, of diabetes mellitus.

Clement Morris, Newark, N. J.; University of the City of New York Medical Department, New York, 1889; member of the Medical Society of New Jersey; a member of the staffs of St. James and Presbyterian hospitals; died November 21, aged 78, of heart disease.

Robert J. Morton, Clay Center, Kan.; College of Physicians and Surgeons of Chicago, 1883; member of the Kansas Medical Society; served in the state legislature as a representative from his district; died December 3, aged 85, of bronchopneumonia.

Henry Allen Moyer * Charlotte, Mich.; Detroit College of Medicine, 1901; since 1939 commissioner, Michigan Department of Health, Lansing; served as medical secretary and personal physician to the late Governor Dickinson of Michigan; past president of the Eaton County Medical Society; member of the American Public Health Association; formerly health officer of Eaton County; died in St. Joseph's Mercy Hospital, Ann Arbor, January 6, aged 67.

Joseph White Murphey, Monroe, La.; University of Nashville (Tenn.) Medical Department, 1908; member of the Louisiana State Medical Society; on the staffs of the E. A. Conway Memorial Hospital and St. Francis' Sanitarium, where he died December 9, aged 66, of pericarditis.

George Louis Nichols, Stafford Springs, Conn.; New York Homeopathic Medical College and Hospital, New York, 1893; a member of the Rotary Club; died in the Cyril and Julia C. Johnson Memorial Hospital December 15, aged 72.

Grover C. Nickell, Morehead, Ky.; Kentucky University Medical Department, Louisville, 1906; member of the Kentucky State Medical Association; for many years physician for the Morehead State Teachers College; died December 16, aged 59, of hypertensive heart disease and lobar pneumonia.

Joseph B. Norman * Tipton, Mo.; Hospital College of Medicine, Louisville, Ky., 1894; died in Rochester, Minn., December 11, aged 79, of post-prostatectomy anuria.

Charles Sumner Orris * Tarentum, Pa.; University of Pittsburgh School of Medicine, 1907; served during World War I; member of the board and on the staff of the Allegheny Valley Hospital; director, Peoples National Bank, and the Peoples Federal Savings and Loan Association; died in the Johns Hopkins Hospital, Baltimore, December 16, aged 63.

Charles Eugene Padelford * Holley, N. Y.; University of Buffalo School of Medicine, 1905; served as health officer of Clarendon, Murray, Holley and Kendall; school physician; formerly county coroner; first president of the Rotary Club; died in the Highland Hospital, Rochester, December 6, aged 74.

Orlando Patton, League City, Texas; Memphis (Tenn.) Hospital Medical College, 1902; member of the State Medical Association of Texas; died in Galveston November 21, aged 62, of cerebrovascular accident and coronary heart disease.

Stuart Zeno Peoples * Petaluma, Calif.; University of California Medical Department, San Francisco, 1904; served during World War I; formerly health officer and city physician; for many years a member and president of the board of education; died November 16, aged 65.

Herman Clarence Riggs, Brooklyn; College of Physicians and Surgeons, New York, 1890; died December 10, aged 78, of senility.

Marion William Rogers * Leon, Iowa; University Medical College of Kansas City, Mo., 1908; secretary and past president of the Decatur County Medical Society; city health officer; for three terms county coroner; secretary of the staff, Decatur County Hospital; died December 7, aged 67, of cerebral hemorrhage.

Hugh Daniel Schell, Hamilton, Ohio; Hahnemann Medical College and Hospital of Philadelphia, 1906; member of the Ohio State Medical Association; died December 14, aged 64.

Louis Schwarz, Philadelphia; Jefferson Medical College of Philadelphia, 1881; died in the Mount Sinai Hospital December 17, aged 82, of carcinoma of the stomach.

A. Macrae Smith * Bellingham, Wash.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1898; fellow of the American College of Surgeons; chief of staff, St. Joseph's Hospital; senior surgeon in reserve of U. S. Public Health Service; served as surgeon for the Northern Pacific Railway; died November 20, aged 69, of heart disease.

Wesley Allan Sorenson, Denham Springs, La.; Louisiana State Medical Center, New Orleans, 1937; member of the Louisiana State Medical Society; died December 3, aged 33.

Walter King Stewart * Sandusky, Ohio; Jefferson Medical College of Philadelphia, 1924; past president of the Mahoning County Medical Society; medical director of the Plum Brooks Ordnance Works; died in the University Hospitals of Cleveland, December 16, aged 44, of pneumococcus meningitis, type III.

John Thomas Sullivan Jr., Boston; Harvard Medical School, Boston, 1897; member of the Massachusetts Medical Society; formerly school physician; served on the staffs of the Carney and St. Elizabeth's hospitals and the Boston Sanatorium; died December 10, aged 70, of Parkinson's disease.

John B. Swabey, Muskegon, Mich.; Atlanta Medical College, 1895; died December 22, aged 72, of carcinoma of the prostate and bladder.

Howard Eugene Truex, San Antonio, Texas; American Medical Missionary College, Battle Creek, Mich., and Chicago, 1901; died November 26, aged 66, of cirrhosis of the liver.

Luther A. Walker, Harveyville, Kan.; Kansas Medical College, Medical Department of Washburn College, Topeka, 1899; formerly a druggist; died in St. Francis Hospital, Topeka, November 15, aged 75.

Horace O. Williams, Lansdale, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1899; member of the Medical Society of the State of Pennsylvania; member of the board of health; a charter member and past president of the Rotary Club; a director of the First National Bank; died in the Chestnut Hill Hospital, Philadelphia, November 28, aged 68, of coronary disease.



LIEUT. COMDR. JAMES G. NEFF
(MC) U. S. Navy, 1904-1943



KILLED IN ACTION

James Gaylord Neff * Surgeon, Lieutenant Commander, U. S. Navy, Sterling, Neb.; Loyola University School of Medicine, Chicago, 1930; U. S. Naval Medical School, 1933; commissioned a lieutenant (ig) in the medical corps of the U. S. Navy in June 1929; awarded the Purple Heart, the American Defense Service Medal, the Second Nicaraguan Campaign Medal, the American Campaign Medal, the European-African-Middle Eastern Campaign Medal and the Asiatic-Pacific Campaign Medal "Two Gold Stars"; Neff Place on the reservation of the new U. S. Naval Hospital, Dublin, Ga., is to be named in his honor by the Bureau of Medicine and Surgery; senior medical officer of the U. S. S. *Juneau*, sunk on Nov. 13, 1942; aged 38; officially declared dead by the Navy Department July 19, 1943.

Correspondence

DIASONE IN TUBERCULOSIS

To the Editor:—In view of the lay publicity regarding our work with Diasone, antedating the appearance of reports in the medical literature, a statement regarding the status of the work is here submitted.

"Diasone" is the trade name given to disodium formaldehyde sulfoxylate, 4-4' diamino diphenyl sulfone. Feldman and his associates (*Arch. Path.* 36:64 [July] 1943) and Callomon (*Am. Rev. Tuberc.* 47:97 [Jan.] 1943) demonstrated favorable alteration in the course of tuberculosis in experimental animals with the administration of this compound. Because of these reports we initiated a clinical study one year ago to determine the defects of Diasone on tuberculosis in man.

To date Diasone has been administered (orally) to 139 patients only under the most rigid sanatorium regimen and strictest laboratory control.

In September 1943 the observations recorded up to that time were reported at the Mississippi Valley Trudeau Society meeting in Chicago. This report has been accepted for publication in the *American Review of Tuberculosis*. A second report covering observations over eight months was given at the November meeting of the Section on Medicine, Philadelphia College of Physicians, and has been submitted for publication to the *Illinois Medical Journal*. A third report dealing entirely with clinical laboratory studies on patients is in preparation.

A program of further investigation is in operation whereby the observations from other sanatoriums will provide further information in regard to the effects of Diasone in the tuberculous patient.

Diasone is still an experimental therapeutic agent. Much more must be learned about dosage, toxic reaction, change which takes place in the tuberculous lesions and the many other ramifications of such a problem. We cannot be too emphatic at this time in stating that this compound is not ready for even limited distribution until a great amount of investigational work is completed.

I trust that this statement will satisfactorily bridge the gap between the recent "news stories" and the appearance of our prepared report in the medical literature.

CHARLES K. PETTER, M.D., Lake Forest, Ill.

To the Editor:—The treatment of tuberculosis with Diasone has been mentioned frequently in the daily press and in the February issues of the *Reader's Digest* and *Your Life*. Since the American Medical Association will probably receive many inquiries on the subject, I thought you would like to know that both the National Tuberculosis Association and its medical section, the American Trudeau Society, have committees attempting to evaluate this chemotherapeutic agent before further publicity is given it.

The National Tuberculosis Association has a Committee on Chemotherapy under the chairmanship of Dr. Leroy U. Gardner, director of the Trudeau Foundation and Trudeau School, Saranac Lake, N. Y. The American Trudeau Society has a Committee on Therapy under the chairmanship of Dr. H. C. Hinshaw, Mayo Clinic, Rochester, Minn. These committees are working in cooperation, and I am sure that either or both would be glad to be of such help as their special experience may enable them to be.

The first article on this clinical study is in the hands of the editor of our journal, the *American Review of Tuberculosis*. I have requested that Dr. Pinner expedite its publication.

JOHN B. BARNWELL, M.D.,
University Hospital,
Ann Arbor, Mich.

President, American Trudeau Society.

ESTROGEN IN CARCINOMA OF THE PROSTATE

To the Editor:—I was interested in the statement by Dr. Charles Huggins in *THE JOURNAL*, January 8, that he and Dr. C. V. Hodges had introduced the treatment of carcinoma by the administration of estrogen and gave as a reference *Cancer Research* 1:293 (April) 1941. Without detracting from the brilliant contribution of Dr. Huggins and his co-workers, the record should be cleared as to the time at which the administration of certain steroid chemical compounds was first suggested as a form of treatment.

In the article in *Cancer Research* Huggins and Hodges reported the reduction in acid phosphatase in patients with cancer of the prostate following injection of diethylstilbestrol 1 mg. daily during periods of from eight to twenty-three days.

In March 1941 I presented a paper entitled "Observations on the Effect of Estradiol Dipropionate and Diethylstilbestrol on Malignant and Hyperplastic Prostatic Tissue" before the Mid Atlantic Section of the American Urological Association in which the course of 7 carcinomas and 22 hyperplasias was described.

On May 31, 1941 a paper entitled "The Effect of Estradiol Dipropionate and Diethylstilbestrol on Malignant Prostatic Tissue" was presented by me at the fifty-third meeting of the American Association of Genito-Urinary Surgeons, Hot Springs, Va. In these two papers the injection of two steroid substances as a method of therapeutic control of extensive carcinoma of the prostate was presented.

WILLIAM P. HERBST, M.D., Washington, D. C.

"THE ROLE OF LIPIDS IN ATHEROSCLEROSIS"

To the Editor:—In *THE JOURNAL*, Dec. 25, 1943 under Current Comment, page 1121, is a discussion of a review by Hirsch and Weinhouse (The Role of the Lipids in Atherosclerosis, *Physiol. Rev.* 23:185 [July] 1943). This review is limited largely to chemical studies and does not include any reference to the physicochemical effects of crystalline cholesterol. The reviewers blandly ignore the facts (Leary, Timothy: The Genesis of Atherosclerosis, *Arch. Path.* 32:507 [Oct.] 1941):

1. That the distinction between atherosclerosis and other forms of arterial disease depends on the presence of visible cholesterol esters in the lesions, not on the presence of phospholipids, glycerides or other lipids.

2. That visible cholesterol under the polariscope is usually ester cholesterol. Visible cholesterol is normally present in the adrenal cortex, sometimes in the interstitial cells of the testicle, in corpora lutea and in sebaceous glands. Visible cholesterol in other sites is excess cholesterol and is associated with disease.

3. That the metabolism of cholesterol is so complex or so difficult (we know little of its metabolism) that excess ester cholesterol is treated as a foreign body, to be engulfed by macrophages and transported to various sites, notably to the arterial intima.

4. That excess ester cholesterol is an irritant comparable to silica sol.

5. That excess cholesterol satisfies all of Koch's postulates with reference to the causation of atherosclerosis. It is constantly present in visible form in the active lesions of the disease. It can be extracted from the lesions. When fed to animals—rabbit, guinea pig, chicken (Dauber, D. V., and Katz, L. N.: Experimental Cholesterol Atherosclerosis in an Omnivorous Animal, *Arch. Path.* 34:937 [Dec.] 1942)—it will (at least in the rabbit, with whose advanced lesions we are most

familiar) reproduce the lesions of the human disease with greater exactness than can the lesions of many human infections be reproduced by the injection of their acknowledged bacterial causes into susceptible animals. The excess cholesterol will be found in the same relation to the experimental as to the natural human lesions.

The other lipids that are found chemically in the aorta of atherosclerosis may accumulate to try to establish a lipid balance, but there is no evidence that they have any other relation to the disease or its causation.

In their discussion of the "mechanism of lipid deposition" the writers seem to readopt the old Virchow-Aschoff "imbibition theory" which has been disproved but still demonstrates the potency of great names to confuse the issue. Atherosclerosis is a disease caused by the presence of an irritant, i. e. excess cholesterol, in ester form, which is brought to the arterial intima in macrophages and does not arrive by imbibition.

The absence of atherosclerosis in youth is due to the removal of excess esters from the intima in the atheroma of infancy and puberty (Leary, Timothy: *Arch. Path.*, to be published).

TIMOTHY LEARY, M.D., Boston.

TRIBAL EPIDEMICS IN THE YUKON

To the Editor:—I read with special interest the article "Tribal Epidemics in the Yukon" (*THE JOURNAL*, Dec. 18, 1943) in which John F. Marchand recounts a series of epidemics observed during the latter part of 1942 and 1943 among some Tlingit speaking Indians on Teslin Lake near the Alaska Highway.

During the summer of 1943 I spent seven or eight weeks in anthropological field work at Fort Nelson, B. C., a small settlement 6 miles east of the Alaska Highway. Numerous visitors from highway construction camps visited the settlement during my presence but the local Indians, Cree and Slave, did no work on the construction of the road with the exception of two part-Indians who, because of their knowledge of horses, were employed as packers for the Public Roads Administration during the winter of 1942-1943. With the exception of the annual "flu" epidemic, which strikes throughout the Mackenzie drainage area during the spring months, no epidemic diseases appear to have touched Fort Nelson since the coming of the highway. There were, however, 2 cases of severe painful sore throat that may have been tonsillitis during my presence. These were relieved by gargling with a hypochlorite solution, medical attention being unavailable to these people except for an Army Air Forces physician at the airport across the river and the Indian agent-physician, who makes an annual visit in August. This lack of medical attention is undoubtedly to blame for the high number of deaths resulting from the spring "flu" epidemics. During the winter of 1942-1943, 17 or 18 out of an Indian population of about 150 in the general area of Fort Nelson are reported to have died, many of "flu." A check of remembered deaths indicates that almost half of the population of the Fort Nelson area has died since 1920.

Although contact with the highway is not great for Fort Nelson and the surrounding region, health conditions for the Indians of the North are in general poor. There is therefore every danger that the opening of the country by the new highway will further aggravate these conditions by exposing isolated persons to outside diseases. These facts deserve the attention of the American and Canadian authorities. As Marchand points out, the Indians may not have less resistance to the white man's diseases when medical attention is available, but they deserve to have that attention in the first place.

JOHN J. HONIGMANN,
61 Edgewood,
New Haven 11, Conn.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in *THE JOURNAL*, Jan. 29, page 320.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, Feb. 21-24. Sec., Dr. B. F. Austin, 519 Dexter Ave., Montgomery.

ARIZONA: * Phoenix, April 4-5. Sec., Dr. J. H. Patterson, 826 Security Bldg., Phoenix.

ARKANSAS: * March. Sec., Dr. D. L. Owens, Harrison. *Eclectic*. Little Rock, June 8. Sec., Dr. C. H. Young, 1415 Main St., Little Rock.

CALIFORNIA: *Written*. Los Angeles, Feb. 7-10. Sec., Dr. Frederick N. Scatena, 1020 N. St., Sacramento.

COLORADO: * Denver, April 4-7. Sec., Dr. J. B. Davis, 831 Republic Bldg., Denver.

CONNECTICUT: * *Medical. Written*. Hartford, March 14-15. *Endorsement*. New Haven, March 28. Sec. to the Board, Dr. Creighton Barker, 258 Church St., New Haven. *Homoeopathic*. Derby, March 13-14. Sec., Dr. J. H. Evans, 1488 Chapel St., New Haven.

DISTRICT OF COLUMBIA: * *Reciprocity*. Washington, March. Sec., Commission on Licensure, Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington.

FLORIDA: * Jacksonville, June 26-27. Sec., Dr. W. M. Rowlett, Box 786, Tampa.

INDIANA: Indianapolis, May 2-4. Sec., Board of Medical Registration and Examination, Dr. W. C. Moore, 301 State House, Indianapolis.

MAINE: Portland, March 14-15. Sec., Board of Registration of Medicine, Dr. A. P. Leighton, 192 State St., Portland.

MASSACHUSETTS: Boston, March 14-17. Sec., Board of Registration in Medicine, Dr. H. Q. Gallupe, 413-F State House, Boston.

MONTANA: Helena, April 3-5. Sec., Dr. O. G. Klein, First National Bank Bldg., Helena.

NEVADA: *Endorsement*. Carson City, Feb. 7. Sec., Dr. G. H. Ross, 215 N. Carson St., Carson City.

NEW HAMPSHIRE: Concord, March 9-10. Sec., Board of Registration in Medicine, Dr. D. G. Smith, State House, Concord.

NEW JERSEY: Feb. 15-16. Sec., Dr. E. S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO: * Santa Fe, April 10-11. Sec., Dr. LeGrand Ward, 141 Palace Ave., Santa Fe.

OHIO: *Endorsement*. Columbus, Feb. 7. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

RHODE ISLAND: * Providence, April 6-7. Chief, Division of Examiners, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

SOUTH CAROLINA: Columbia, June 26-28. Sec., Dr. N. B. Heyward, 1329 Blandena St., Columbia.

WYOMING: Cheyenne, Feb. 7-8. Sec., Dr. M. C. Keith, Capitol Bldg., Cheyenne.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

COLORADO: Denver, March 8-9. Sec., Dr. E. B. Starks, 1459 Ogden St., Denver.

CONNECTICUT: Feb. 12. Address State Board of Healing Arts, 250 Church St., New Haven.

DISTRICT OF COLUMBIA: Washington, April 17-18. Sec., Commission on Licensure, Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington.

FLORIDA: Gainesville, June 8. Sec., Dr. J. F. Conn, John B. Stetson University, DeLand.

IOWA: Des Moines, April 11. Dir., Division of Licensure and Registration, Mr. H. W. Greffe, Capitol Bldg., Des Moines.

NEW MEXICO: Feb. 7. Sec., Miss Pia Joerger, State Capitol, Santa Fe.

OREGON: Portland, March 4. Sec., Board of Higher Education, Mr. C. D. Byrne, University of Oregon, Eugene.

RHODE ISLAND: Providence, Feb. 16. Chief, Division of Examiners, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

SOUTH DAKOTA: Vermillion, June 4-5. Sec., Dr. G. M. Evans, Yankton.

WISCONSIN: Madison, April 1. Sec., Prof. R. N. Bauer, 152 W. Wisconsin Ave., Milwaukee.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Malpractice: Alleged Negligence of Examining Physician for Selective Service Board.—When the plaintiff was 8 years old his right hip was injured by a fall, the femoral head being dislocated from the acetabulum. The normal position was never regained and the hip became stiff and rigid, motion in the right leg was restricted, that leg became about 2 inches shorter than the other and the plaintiff was unable to stoop over. When the plaintiff was 38 years old, pursuant to a notice from his local selective service board, he reported for a physical examination to the office of the defendant physician, who was serving as a resident examiner for that board. The physician, after being informed of the earlier injury, instructed the plaintiff to stand on his right leg and to raise the left leg up "to see how . . . [the] leg acted under the weight of . . . [the] body." Next the physician had the plaintiff lie down on a table and then drew some blood for a serum test. When the physician left the room to put the blood in a laboratory container, the plaintiff left the table and sat down on a chair. He was "wobbly" on his feet and felt "lightheaded." When the physician returned to the room he found that the plaintiff had fainted and he proceeded to revive him, forcing his head and trunk forward until his head rested between his legs. This action, the plaintiff subsequently alleged in a suit for malpractice he instituted against the physician, permanently injured him by severely straining his right hip and breaking and tearing the ligamentous adhesions around the hip that had formed from the prior injury. At the close of the plaintiff's case the trial court denied motions made by the physician for a nonsuit and for a directed verdict. From a judgment for the plaintiff the physician appealed to the Supreme Court of Oregon.

The sole question, said the Supreme Court, is whether any substantial evidence was adduced at the trial to support the verdict of the jury, which of necessity was based on an implied finding that the physician had carelessly and negligently forced the plaintiff's head and trunk forward as stated and that that act had resulted in the injuries of which the plaintiff complained. The evidence did not justify such a conclusion, the court held. The defendant testified, said the court, that he simply put his hand on the plaintiff's head when he found him in an unconscious state and, using only slight pressure, helped him "to maintain his position leaning forward," in order to cause compression on the abdominal vessels and thereby force blood to the brain. According to the undisputed testimony at the trial this is an approved method of reviving a patient who has fainted while in a sitting position. The plaintiff claimed, however, that such a method should not have been used in view of his known physical condition. The plaintiff testified that after regaining consciousness he ascertained that the defendant physician had his hand on the back of the plaintiff's neck trying to get his head between his knees and that he told the physician "You are hurting me, you can't do that" and that the physician replied "Well, I noticed your leg went sideways when I pushed your head down." The physician testified that the pressure put on the plaintiff's head had no relation whatever to his injuries and in this conclusion he was corroborated by another physician, who was the only expert medical witness testifying at the trial. This other witness, who examined the plaintiff about seven months after the occurrence of the alleged malpractice on the part of the defendant physician, further testified that the plaintiff's condition resulted from his old injury and not from anything that the defendant physician had done and that the bending forward of the plaintiff would not cause an injury to the hip, since it would take a great deal of force to break adhesions around the hip. This physician also interpreted the radiographs which he had taken of the plaintiff and stated that the head of the femur was practically gone, as it had been absorbed as a result of chronic arthritis of many years' duration. There was evidence also at the trial that the plaintiff after being revived in the defendant's office walked to his

automobile and went home unassisted and that he stayed in bed the next two days, when he came to the defendant's office without crutches to secure a note from the physician to his employer explaining his absence from work. The physician gave the plaintiff a note that stated that the plaintiff had "passed out" in the physician's office and that "in the subsequent maneuvers he sustained a sprain of his injured hip which accounts for his not being on the job for a few days." There was also evidence that prior to the examination in the physician's office the plaintiff was capable of doing light manual labor and walked without crutches, although at times the weight on his injured hip would cause him intense pain. After the examination he continued to work for about one month, but, according to his own testimony, he was obliged to quit on account of his leg "giving out" on him.

For the plaintiff to recover, continued the court, there must be substantial evidence that (1) the defendant was guilty of negligence as charged in the complaint and that (2) such negligence was the proximate cause of the alleged injury. It must be conceded that the note given to the plaintiff by the defendant physician to be presented to the plaintiff's employer is a declaration against his interest and tends to show that he caused a sprain of the injured hip. This court must consider this note as evidence tending to show that what the defendant did was the proximate cause of the plaintiff's aggravated injury. The note does not, however, admit negligence on the part of the physician. The mere fact, in itself, that plaintiff sustained an injury while the defendant was undertaking to revive him does not establish negligence. The more pertinent inquiry is: did the defendant physician exercise that degree of care which, under all the facts and circumstances of the case, would ordinarily have been exercised by a physician practicing his profession in similar localities? There was no expert medical witness offered by the plaintiff to support his charge of negligence. The only expert witness who did testify asserted positively that the defendant physician, in undertaking to revive the plaintiff, followed the approved method. Now, by what standard is the defendant physician to be judged in the practice of his profession pertaining to cases of this character? Is it for a juror who has no knowledge in this field of science to say that the defendant did something he ought not to have done in the light of the known physical condition of the plaintiff? Or should the conduct of the defendant be measured by the standard of his own profession when matters of technical knowledge and skill are involved? The answer seems obvious. We do not mean to hold that, in all cases, the charge of negligence against a physician must be determined exclusively by expert testimony. There are some things of a nontechnical nature occurring in the practice of medicine and surgery which a layman might well comprehend and understand. Under such circumstances, the juror needs no expert witness for his guidance and enlightenment. In this case, however, we think the propriety or impropriety of the method adopted by the physician is not a matter of common knowledge and that expert testimony was essential to establish the charge of negligence. Furthermore, it is significant that, while the plaintiff was examined and treated by several physicians subsequent to his alleged injury by the physician here involved, none of them were subpoenaed by him to testify.

Since the court could find no competent substantial evidence in the record tending to show negligence on the part of the defendant physician, it reversed the judgment of the trial court in favor of the plaintiff.—*Nation v. Gueffroy*, 142 P. (2d) 688 (Ore., 1943).

Society Proceedings

COMING MEETINGS

- Annual Congress on Industrial Health, Chicago, February 15-16. Dr. Carl M. Peterson, 535 N. Dearborn St., Chicago 10, Secretary.
- Annual Congress on Medical Education and Licensure, Chicago, February 14-15. Dr. Victor Johnson, 535 N. Dearborn St., Chicago 10, Secretary.
- National Conference on Medical Service, Chicago, February 13. Dr. C. L. Palmer, 500 Penn Avenue, Pittsburgh 22, Secretary.
- New Orleans Postgraduate Medical Assembly, New Orleans, March 6-9. Dr. Joseph S. D'Antoni, 1430 Tulane Ave., New Orleans 13, Secretary.
- Society of University Surgeons, Nashville, Tenn., February 10-12. Dr. Alexander Brunschwig, 950 East 59th St., Chicago, 37, Chairman, Program Committee.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1934 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Alabama State Medical Assn. Journal, Montgomery

13:157-184 (Nov.) 1943

Our Health and the Federal Trade Commission. J. J. Durrett.—p. 157.
Coccidioidomycosis. J. D. Bush.—p. 159.
Internal Derangements of Knee Joint. J. D. Sherrill.—p. 167.
Functional Disorders of Upper Digestive Tract. H. M. Simpson.—p. 171.

13:185-216 (Dec.) 1943

Management of Acute Appendicitis. E. Drennen.—p. 185.
Constipation in Infancy and Childhood. W. H. McCaslan.—p. 187.
Cancer of Breast. J. L. Carmichael.—p. 190.
Surgical Jaundice. J. M. Washam.—p. 193.

American Journal of Hygiene, Baltimore

38:223-346 (Nov.) 1943

Anerogenic and Indole Forming Salmonella Variants. E. Seligmann and I. Saphra.—p. 223.
Salmonella Infections in Man: Analysis of 1,000 Cases Bacteriologically Identified by New York Salmonella Center. E. Seligmann, I. Saphra and M. Wassermann.—p. 226.
Food Borne Streptococcus Poisoning and Infection: Differentiation of Staphylococcal Enterotoxin from Toxic Substances Produced in Mince Tissue Media by Hemolytic Streptococci and Other Agents. G. E. Foley, S. M. Wheeler and V. A. Getting.—p. 250.
Ten Year Population Study of Rabbit Tick Haemaphysalis Leporis-Palustris. R. G. Green, C. A. Evans and C. L. Larson.—p. 260.
Virulence of Tularemia as Related to Animal and Arthropod Hosts. R. G. Green.—p. 282.
*Studies on Intestinal Parasites of Mental Patients. R. Burrows.—p. 293.
Effectiveness of Pertussis Vaccine: An Application of Sargent and Merrell's Method of Measurement. E. S. Weiss and Pearl L. Kendrick.—p. 306.
Pathogenic and Antigenic Properties of Dermal Vaccinia Virus Propagated in Chorioallantois of Chick Embryos. G. J. Buddingh.—p. 310.
Factors Determining Severity of Poliomyelitis in Macaca Mulatta. F. J. Moore and J. F. Kessel.—p. 323.

Intestinal Parasites of Mental Patients.—Burrows and infestation of mental patients with intestinal parasites in the South Carolina State Hospital. The aim was to determine the extent of infestation, so that a program of treating patients and eliminating sources of infection could be carried out. The study included the determination of the presence of both protozoa and helminths by means of the simple smear, the iodine stained smear and, in doubtful cases of amebic infestation, the iron-hematoxylin preparation; also the examination of anal swabs to detect the incidence of pinworms; the examination by flotation methods, of soil samples from the exercise yards; the examination by adhesive cellulose tape methods of samples taken from the walls, doorknobs, furniture and toilet seats in the buildings; the determination in a representative group of females of the egg count per gram of stool, and a study of the untidy habits of patients who had been in the institution long enough to be transferred from the receiving wards. Over 3,000 stool specimens from 2,055 patients, and anal swabs from 1,383 patients, were examined. The rates of parasite infestation in 637 newly admitted patients gave an indication of the rates for the state and a basis for comparison with patients who have been in the hospital for longer periods. Mental patients show higher infestation rates for most intestinal parasites than do noninstitutionalized persons. There is an increase in number of species per patient and a greater intensity of worm infestations with increased residence. Untidy habits lead to the acquisition of many infections. There is an increase in infestation in nurses and attendants who work with the more deteriorated patients. Grounds and buildings were examined for sources of infestation. A steam hood devised for disinfecting the soil proved effective.

Am. J. Roentgenol. & Rad. Therapy, Springfield

50:575-718 (Nov.) 1943

Similarity of Clinical and Roentgen Findings in Childer Sarcoma (Endothelial Myeloma) and Sympathetic R. P. Barden.—p. 575.
Renal Dysplasia or Renal Rickets. R. C. Moehtig.—p. 581.
*Epidermoid Carcinoma of Tibia: Report of 2 Cases. p. 602.
*Fractures of Ribs Following Interstitial Radium Cancer of Breast. H. Wammock and R. K. Arbuckle.
Effects of Roentgen Irradiation on Cardiovascular System. p. 616.
Modification of Radiosensitivity of Skin: VI. Effects of and Low Temperature on the Roentgen Irradiation Human Skin. T. C. Evans and H. D. Kerr.—p. 629.
Group of Persons Whose Skin and Subcutaneous Tissues are Sensitive to Roentgen Rays. A. U. Desjardins.—p. 631.
Effect of Roentgen Rays, Radon and Radioactive Phosphorus Chloride. C. E. Danlip and F. C. Robbins.—p. 635.
Roentgen Ray Measurements up to 400 Kilovolts Made with Window Tubes. L. D. Trout and Z. J. Atlee.—p. 643.
Dose Measurements in Contact Roentgen Therapy. Quimby and Elizabeth F. Focht.—p. 653.
Depth Dose Measurements in Contact Roentgen Therapy of Test Object (Rabbit's Skin).—p. 669.
New Medium for Gallbladder Visualization. M. G. Wack.
Observations on Proflax: New Contrast Medium for Vis of the Gallbladder. W. A. Marshall.—p. 680.

Epidermoid Carcinoma of Tibia.—Kraft saw 2 in of epidermoid carcinoma of the tibia within three months. logically there are two types of invasion carcinoma of the (1) ulcer carcinoma, which arises within a chronic ulcer leg, and (2) fistula carcinoma, which originates in a fistula tract or osseous sinus. These two predisposing conditions persist for years without becoming malignant. His first gave a history of recurrent ulcers dating back more than 10 years. In the second case there was a chronic osteomyelitis. In both instances the malignant growth developed rather slowly and progressed rapidly. The first patient came to hospital after a pathologic fracture had occurred. The patient lost 20 pounds (9 Kg.) during a period of six months and noticed progressive oozing of the leg and progressive weakness. The correct diagnosis was obvious in the first case because of the far advanced osteolytic process. The second case was somewhat complicated because of a typical osteomyelitis. The x-ray appearance was similar to that reported by Hellner. The prognosis of the condition is favorable even in advanced cases, since distant metastatic lesions have been rarely observed. Amputation of the diseased leg is usually indicated unless an early diagnosis allows more conservative procedures. In chronic osteomyelitis efforts should be made to cure residual active foci. With an increase in secretions and development of pain and hemorrhage periodic roentgenologic and biopsy studies are advisable to determine the presence of an epidermoid carcinoma. Dockerty and Meyerding recently reported 2 cases of adamantinoma of the tibia. They concluded that tibial adamantinomas are merely modified squamous cells which vary considerably in their differentiation into ameloblasts. The fact that adamantinoma is closely related to epidermoid carcinoma finds further corroboration in the following common characteristics: (1) a long history of chronic irritation with episodes of either initial or aggravating trauma and (2) sites of predilection in the tibia, jaw bones and skull.

Fractures of Ribs Following Radium Therapy for Cancer.—Wammock and Arbuckle report 10 cases in which fractures of ribs followed treatment by interstitial radium element needles for cancer of the breast. Clinical evidence of cancer was not observed for periods ranging from four to nine years. In most instances the fractures appeared in less than two years. In 1 case a fracture was detected as early as eleven months after treatment. In the differential diagnosis traumatic fracture and neoplastic fracture must be considered. A traumatic fracture can be distinguished on the basis of a careful history. In neoplastic fracture the x-ray treated area shows regeneration of bone. The lack of healing of the ends of the fracture process. Although, examination of the patient and the lack of verification, the author considers the consideration of the

post-gamma irradiation effect. They think that this effect is brought about by interference with the blood supply of the ribs. It is evident that adult bone is not resistant to therapeutic irradiation directed to a nearby neoplasm.

Annals of Internal Medicine, Lancaster, Pa.

19:707-828 (Nov.) 1943

- *Penicillin as Chemotherapeutic Agent. M. H. Dawson, Gladys L. Hobby, K. Meyer, and Eleanor Chaffee.—p. 707.
- *Reactions to Parenteral Fluid Administration. M. M. Strumia, J. J. McGraw and A. Blake.—p. 718.
- Nutrition and Resistance. F. J. Stare.—p. 735.
- Psychosomatic Illnesses in Urban Practice. R. S. Leadingham.—p. 741.
- Effects of Novocain Injections on Simulated Visceral Pain. D. Young.—p. 749.
- Calcareous Pancreatitis; Report of 3 Cases with Autopsies. J. G. Pasternack.—p. 757.
- Allergic Reactions to Liver Extract. R. E. Kaufman, L. Farmer and C. Reich.—p. 768.
- *Management of Paroxysmal Tachycardia Including Use of Mecholyl. P. W. Morgan.—p. 780.
- *Treatment of Subacute Bacterial Endocarditis: Current Results. S. S. Lichtman.—p. 787.
- Psychosis Due to Sulfonamides. R. E. Kinsey.—p. 795.

Penicillin as Chemotherapeutic Agent.—According to Dawson and his collaborators penicillin exhibits a remarkable antibacterial action against gram positive organisms, gonococci and meningococci. It is not effective against gram negative bacteria. Its activity is of a totally different order of magnitude from that of any of the sulfonamide compounds. Penicillin is effective both in vitro and in vivo. It is active in the presence of pus and inflammatory exudates. Its action appears to be either bactericidal or bacteriostatic, depending on the conditions of the experiment. Penicillin appears to be completely nontoxic in doses far exceeding those necessary for therapeutic purposes. Because it is rapidly excreted by the kidneys, frequent administration is necessary to maintain an adequate blood concentration. It promises to be a chemotherapeutic agent of great clinical value. The clinical use of penicillin so far has been greatly hampered by the small yield. A number of cases have been treated with dramatic results. Penicillin has been proved to be effective in man when given intramuscularly, intravenously and intrathecally. It has also proved effective when administered directly into joints and serous cavities, as well as in local applications.

Reactions to Parenteral Fluid Administration.—According to Strumia and his co-workers, reactions to intravenously administered fluids such as whole blood, plasma, human serum and crystalloid solutions may be inherent in the fluid or may be peculiar to the recipient or to a combination of these two factors. The most common reactions due to causative elements inherent in the fluid alone may be pyrogenic, nitritoid, embolic or mechanical in character. Reactions due to inherent qualities of the fluid combined with conditions of the patient may be hemolytic and allergic. Conditions inherent in the recipient alone which increase the incidence of reactions may be due to hyperhemolysis, liver disease, hypoproteinemia and cardiac insufficiency. Free hemoglobin, potassium content, temperature and air embolism are elements often mentioned as potential or actual causes of reactions. Pyrogenic reactions are by far the most common. To avoid these they make the following recommendations: 1. Avoid contamination of the fluids remaining unused after administration. 2. Clean the glassware and other apparatus properly and follow it by rapid drying or sterilization. 3. Do not store distilled water for more than three hours after preparation unless sterilized. A regular system should be instituted for the reporting in detail of all reactions occurring, so that critical scrutiny of each case will allow improvement of the service.

Management of Paroxysmal Tachycardia.—According to Morgan, paroxysmal supraventricular tachycardia is a common functional cardiac abnormality usually seen in normal hearts. Most attacks do not require medical attention, but it is estimated that 10 to 20 per cent defy the patient's efforts to stop them. To prevent attacks, attention should be given to extracardiac somatic factors; reassurance to the patient and investigation of psychic factors are indicated. If drugs are used because attacks are frequent and tend to persist and annoy the patient, quinidine is best, but an occasional patient responds better to digitalis. Sedatives are helpful. An attack that

develops can usually be stopped by some form of carotid sinus reflex elicitation, by sedatives or by the oral administration of quinidine. If the latter is ineffective, digitalis has been used either orally or parenterally, but mecholyl is preferred if parenteral therapy is indicated. The patient receiving mecholyl should be recumbent, since the erect posture at the height of the drug's action may cause fainting. The average dose of mecholyl for adults is 20 to 50 mg. Mecholyl is administered subcutaneously below or distal to the blood pressure cuff, which is not inflated. At the moment the heart rhythm and rate return to normal as detected by the stethoscope over the precordium, the blood pressure cuff is inflated to prevent further absorption and to make a vein ready if desired for the administration of atropine. The return to sinus rhythm has occurred in the author's experience as early as eighty seconds after the mecholyl injection. If no effect is manifest thirty minutes after the injection, another dose can be given. The rapid rhythm is interrupted by a brief period of asystole; the next few beats seem slightly slower than the normal sinus rhythm, which is quickly established. The quick transition from a heart rate of 160 to 180 to one of 70 or 80 with the brief asystole is usually noted by the patients, though the relief from the rapid rate is ample reward for the brief moment of what they have termed a "funny feeling." No deaths have been reported from the use of mecholyl, but reports are available of great overdosage and mistaken intravenous administration and in each instance recovery was complete.

Treatment of Subacute Bacterial Endocarditis.—Lichtman found that the recovery rate among 704 patients averaged 5.5 per cent. Of 489 patients given sulfonamide chemotherapy 21 recovered, giving an incidence of 4 per cent; among the remaining 215 patients given chemotherapy supplemented by heparin or fever therapy 18, or 8.5 per cent, recovered. Of 109 heparinized patients 7 recovered, giving an incidence of 6.5 per cent. Of 61 patients treated with artificial fever therapy 4 recovered, an incidence of 6.5 per cent recovery. The incidence of spontaneous recovery in subacute bacterial endocarditis is estimated at approximately 1 per cent. Artificial fever therapy supplementing sulfonamide chemotherapy produced a slight but significant increase in recovery rate from 4 to 6.5 per cent. Intravenous typhoid vaccine likewise appeared to give an increased recovery rate. The evaluation of heparinization requires further trial. Surgical ligation of a patent ductus arteriosus complicated by subacute bacterial endocarditis gave the highest percentage of recoveries. Failure to effect recovery in a large series of cases of subacute bacterial endocarditis treated by current methods does not justify the blanket rejection of published reports of recovery as spurious cases of subacute bacterial endocarditis. Until methods of treatment are further improved, every patient with subacute bacterial endocarditis should receive intensive sulfonamide chemotherapy to tolerance. The choice of supplementary therapeutic measures rests with individual preference.

Archives of Physical Therapy, Chicago

24:639-706 (Nov.) 1943

- Causalgic States Following Injuries to Extremities. G. de Takats.—p. 647.
- Physical Treatment of Disabilities of Foot Commonly Encountered in Military Service. T. E. Dredge.—p. 653.
- Some Thoughts About Shock Therapy. C. A. Neymann.—p. 660.
- Nature and Chemical Action of Ultraviolet Light. G. K. Rollefson.—p. 664.
- *Treatment of Shock, with Special Reference to Use of Heat and Cold. W. H. Cole.—p. 670.
- Rehabilitation. H. E. Mock.—p. 676.

Treatment of Shock with Reference to Heat and Cold.—Cole shows that the application of heat as practiced in the treatment of shock has been proved to be erroneous and actually damaging to the patient. Ordinarily thermal therapy may be ignored, since room temperature, with perhaps the application of a single blanket as utilized in the postoperative wards of a hospital, will be the most favorable circumstances from the standpoint of heat or cold. The most deleterious effect from heat is derived from the increase in the metabolic rate and consequent increased oxygen consumption. Since the body already is in a state of anoxia, this increase in the metabolic rate and oxygen consumption becomes harmful. Heat is also

cent and of puerperal infection 4.6 per cent in the quinine series, and 8.0 per cent and 6.8 per cent respectively in the control series. It is concluded that the use of quinine in obstetrics may prove to be of little value.

Radiology, Syracuse, N. Y.

41:421-526 (Nov.) 1943

- *Roentgenologic Aspects of Acute and Chronic Esophagitis. L. W. Paul.—p. 421.
- Roentgenologic Manifestations of Pleuropulmonary Involvement in Tularemia. F. E. Bilss and H. I. Berland.—p. 431.
- Roentgenographic Diagnosis of Neoplasms of the Periapillary Region and Head of the Pancreas. A. Brunschwig and F. E. Templeton.—p. 438.
- Nonorganic Gastric Filling Defects Simulating Carcinoma. E. L. Jenkinson and K. K. Lattier.—p. 444.
- Observations on Venography of the Lower Extremities. E. C. Baker and S. H. Sedwitz.—p. 451.
- Roentgen Diagnosis of Biliary Tract Tumors. S. Brown, J. E. McCarthy and A. Fine.—p. 459.
- Roentgen Rays in Treatment of Cervical Lymphadenitis. R. Rosh and W. P. Quin.—p. 464.
- Review of Scott Wide Field X-Ray Treatment. G. F. Pfahler.—p. 468.
- Apparently Solitary Myeloma of Bone with Subsequent Generalization: Favorable Response to Irradiation with Unusual Reactions. B. J. Toth and J. A. Wintermantel.—p. 472.
- *Recovery of Radium Tubes from Sewer. M. M. D. Williams.—p. 478.
- X-Ray Therapy in the Army. J. L. Barner.—p. 483.

Roentgenologic Aspects of Esophagitis.—Acute ulcerative esophagitis is a lesion frequently seen at necropsy but is rather uncommon as a clinical disease, suggesting that there must be a pronounced lowering of general resistance before it can develop. Clinically, acute ulcerative esophagitis is most often associated with peptic ulcer or develops during the immediate period following upper abdominal operations. Anything which tends to cause relaxation of the cardia, permitting acid gastric juice to come in contact with the esophageal mucosa, may predispose to its development. Frequent vomiting is an important factor. The use of a negative suction apparatus in itself is of questionable importance but may play a part when additional causes are present. The x-ray appearances, according to Paul, consist of a severe spasm of the distal part of the esophagus, loss of mucosal folds, and a fine roughening of surface. The lesion tends to progress to a fibrous stricture.

Chronic esophagitis of sufficient severity to be the cause of symptoms is also uncommon. If it is present for a sufficient length of time, the x-ray findings may be those of a diffuse fibrous stricture, since the esophagus shows a great tendency for the development of fibrosis when involved by infection. In other instances of chronic esophagitis the most striking x-ray manifestation is intermittent, diffuse spasm of the lower half or third, with thickening of the mucosal folds.

Recovery of Radium Tubes from Sewer.—Williams gives an account of a search for three radium tubes. Each contained approximately 50 mg. of radium and was sealed inside a glass tube, which in turn was sealed inside a tube of monel metal. The outside dimensions were $1\frac{1}{16}$ inches in length and a little less than $\frac{1}{4}$ inch in diameter. At all times while a scraper, or other object, was being pulled through a section of sewer, the Geiger-Müller tube was suspended in the downstream manhole to detect the approach of a radium tube, and a fine mesh screen was at all times kept ready to be placed over the outflow opening in the manhole to prevent a tube from being washed into the next section of sewer. Six weeks after the tubes had been lost two of the radium tubes were retrieved from the sewer, one being attached to a wadded up fire chain that had been pulled through the sewer, and the other was pushed ahead of a scraper. It was believed that the third might be lodged in a crevice, where it could not be dislodged by anything pulled through. It was decided, therefore, to try to determine definitely whether or not the tube was in a given section of sewer before attempting to clean it. Pulling the Geiger-Müller tube through the sewer proved impracticable during wartime because of the shortage of suitable shielded cables. It was decided to use a Lauritsen electrometer or a Victoreen minometer. Preliminary tests revealed that the Victoreen minometer was only about one fifteenth as sensitive as the electrometer. The latter instrument localized the tube in a

circumscribed area, where it was discovered in a deposit about 2 inches thick in the bottom of the sewer. Electrosopes and Geiger-Müller counters have been used by several searchers in the past to locate radium in sewer lines, but, as far as is known, this is the first time such an instrument has been pulled through a sewer.

Rocky Mountain Medical Journal, Denver

40:713-792 (Nov.) 1943

- Industrial Medical Program of Army. H. R. Hennessy.—p. 730.
- Neurologic Treatment in General Practice. H. R. Carter.—p. 733.
- Suppurative Pneumococcal Arthritis. Report of Case Treated with Sulfathiazole. B. N. E. Cohn.—p. 737.
- 40:793-866 (Dec.) 1943
- Burns: R. T. Richards.—p. 810.
- Management of Minimal and Moderately Advanced Case of Pulmonary Tuberculosis. A. Rest.—p. 816.
- Sulfonamide Therapy. R. A. Kocher.—p. 821.
- Waterhouse Friderichsen Syndrome. Three More Cases. F. Mayner.—p. 827.

Surgery, St. Louis

14:645-806 (Nov.) 1943

- Surgical Service of Station Hospital in Middle East. F. E. Walton.—p. 645.
- Traumatic Surgery: Review of Some Bone and Joint Injuries in Wartime. A. G. Ord, R. Shackman and H. L. M. Roualle.—p. 651.
- Effect of Sulfur Compounds on Blood Clotting. G. De Takats.—p. 661.
- *Effect of Heparin on Experimentally Produced Venous Thrombosis. J. Rabinovitch and B. Pines.—p. 669.
- Intravenous Clotting and Its Sequelae. A. Ochsner and M. DeBakey.—p. 679.
- One Stage Perineoabdominal Operation for Cancer of Rectum. A. O. Singleton.—p. 691.
- Appendical Abscess. A. I. Chenoweth.—p. 702.
- *Intussusception: Ninety-Two Cases in Infancy and Childhood. E. W. Gibbs and P. W. Sutton.—p. 708.
- Mastitis Obliterans. R. L. Payne, A. F. Strauss and R. D. Glasser.—p. 719.
- *Use of Intravenous Ammonium Chloride in Treatment of Alkalosis. H. A. Zintel, J. E. Rhoads and I. S. Ravdin.—p. 728.
- Role of Surgery in Treatment of Malignant Skin Tumors. D. P. Slaughter.—p. 732.

Effect of Heparin on Experimentally Produced Venous Thrombosis.—Rabinovitch and Pines produced in rabbits a thrombus in a vein by injuring its endothelial lining and slowing the local circulation. Liquaemin was shown to be a powerful anticoagulant of the rabbit's blood even when administered in small single doses. The administration of liquaemin before injuring the vein and the formation of a thrombus prevented the subsequent development of a local intravascular clot. It was found unnecessary to administer the anticoagulant continuously in order to obtain the desired effects. In a certain number of cases liquaemin proved effective in causing the solution or disappearance of a thrombus but only when given during the early stages of clot formation. It was of no effect when given late after the clot had already organized.

Intussusception in Infancy and Childhood.—Gibbs and Sutton analyze 92 cases of intussusception observed between 1927 and 1942; 62.5 per cent of the patients were infants between 2 and 11 months of age; 62 per cent of the patients were boys and 38 per cent were girls. Intermittent colicky abdominal pain, vomiting and passage of bloody stools were present in less than one half of the cases. Abdominal pain was present in 73.3 per cent. Vomiting usually appears early and in many small infants was the first sign. It was recorded in 89.5 per cent of the cases. A history of blood in the stool, hematochezia, was noted in only 70.9 per cent of the cases. A palpable abdominal mass was recorded in only 64.3 per cent. Every case of intussusception is a surgical emergency requiring immediate operation. Reduction was all that was done in 25 cases, with a mortality rate of 40 per cent. In 16 cases some attempt was made to fix the bowel and prevent recurrence in addition to reduction. The mortality in this group was 25 per cent. In 32 cases appendectomy was done, with an associated mortality of 3.1 per cent. Reduction and Meckel's diverticulectomy were done in 2 cases with 1 death. Resection and primary anastomosis was done in 7 cases with a mortality of 42.9 per cent. There were 77 cases in which reduction was accomplished without major bowel resection, with 17 deaths, a mortality rate of 22.1 per cent. In 14 cases in which some form of major resection was necessary there were 10 deaths, a mortality of 71.5 per

cent. In the latter group the results with resection and primary anastomosis were better than with the establishment of an enterostomy. Care in establishing fluid and electrolyte balance before operation and maintaining it during and after operation with intravenous and subcutaneous administration of fluids, and the more frequent use of oxygen therapy have contributed to improved results.

Intravenous Ammonium Chloride in Alkalosis.—Zintel and his associates think that the use of continuous suction drainage of the stomach, especially in the preoperative preparation of patients with pyloric obstruction, has been responsible for most of the cases of severe alkalosis. It was generally believed that if the body was supplied with sufficient isotonic solution of sodium chloride and if ketosis was prevented, the electrolyte pattern of the plasma would be adjusted satisfactorily by the kidneys. The patients whose histories are reviewed here all received fluid and sodium chloride in amounts calculated to restore their plasma electrolyte patterns. The authors believe that the intravenous injection of ammonium chloride is at times justified for patients with severe alkalosis who have been treated with ample fluid and sodium chloride. In most instances the response to this therapy was quite uniform. It appeared that for an adult of 150 pounds (68 Kg.) 1 Gm. of intravenous ammonium chloride will reduce the serum carbon dioxide by an average of 1.1 volumes per cent. Two per cent solutions of ammonium chloride were prepared by dissolving 20 Gm. of ammonium chloride in a liter of water, 0.9 per cent sodium chloride solution or 5 per cent dextrose solution. In most instances the solution was brought to boiling just before the ammonium chloride was added and then allowed to cool slowly. It was used as soon as it had cooled sufficiently. The rate of administration varied with the exigencies of the case, but usually it was not greater than 1,000 cc. in two hours. The ammonium chloride solution was administered intravenously to 7 patients without harm. It was effective in rapidly lowering the serum carbon dioxide at the rate of approximately 1 volume per cent for each gram administered to adults of medium size and weight. Sufficient evidence has not accumulated to determine the safety of this method of administration, but it appears sufficiently safe to warrant its use in severe alkalosis that cannot be corrected by the administration of salt and fluids promptly enough to avert the danger of renal changes.

Virginia Medical Monthly, Richmond

70:593-644 (Dec.) 1943

- Medical Operation in Pacific Theaters. C. C. Hillman.—p. 594.
Low Backache from Viewpoint of Gynecologist. R. H. Hoge.—p. 598.
Problem of Military Rights and Casualties. S. W. Hamilton.—p. 602.
Doctor's Own Wife—His Fourth Investment. J. B. McClinton.—p. 606.
Lytic Quadrilateral Gangrene—Report of an Unusual Case. E. M. Fusco and T. Kell.—p. 611.
Use of Sodium Pentothal Anesthesia. N. G. Patterson.—p. 613.
Complete Roentgen and Ophthalmologic Examination for Ochronosis in Two Alcaptonuric Children. L. D. Abbott Jr., F. B. Mandeville and W. J. Rein.—p. 615.

War Medicine, Chicago

4:459-548 (Nov.) 1943

- Dysenteries and Diarrheas: Their Importance in Military Service. G. R. Callender.—p. 459.
Frequency of Craniocerebral Injuries in Relation to Military Screening Examinations. L. A. Pennington and R. J. Mearin.—p. 465.
Effect of Simulated High Altitudes on Subsequent Work Output. E. E. Foltz and A. C. Ivy.—p. 471.
Syncope Reactions During Simulated Exposure to High Altitude in Decompression Chamber. J. Romano, G. L. Engel, J. P. Webb, E. B. Ferris, H. W. Ryder and M. A. Blankenhorn.—p. 475.
Psychoneuroses of War. F. P. Moersch.—p. 490.
Heart in Dengue: Some Observations Made Among Navy and Marine Combat Units in South Pacific. A. S. Hyman.—p. 497.
"Pulsating" Hematoma (False Aneurysm). W. C. Beck.—p. 502.
Psychopathic Military Prisoner. N. Blackman.—p. 508.
Care of Wounded in Theaters of Operation: Circular Letter No. 178.—p. 514.

Effect of High Altitude on Work Output.—Foltz and Ivy report experiments on 4 medical students. One had been trained for over one and one-half years on a bicycle ergometer. Two had been trained for six months and 1 for three months before this experiment was begun. Three times each week these subjects were put into the decompression chamber, where altitudes from 2,000 to 18,000 feet were simulated for an hour.

On coming out of the chamber the subjects would work to fatigue on an electrodynamic brake bicycle ergometer, then rest for ten minutes on a bed and again work to fatigue. The subjects were first subjected to a simulated altitude of 10,000 feet for one hour. This had no effect on the subsequent work output of any of them. Next, a simulated altitude of 15,000 feet for one hour was used, with indefinite results. The highest simulated altitude to which the subjects could safely be submitted for one hour without oxygen was 18,000 feet. Exposure to this altitude without oxygen for one hour caused a decrease in the subsequent work output of 3 of 4 trained subjects. A rest period of from twenty to thirty minutes between their coming out of the decompression chamber and working was not sufficient for 3 of 4 trained subjects to permit complete recuperation. Exposure to a simulated altitude of 18,000 feet without oxygen for one hour produced no consistent change in the ability of 4 trained subjects to recover from the effects of working to exhaustion. Exposure to this altitude without oxygen for one hour produced cyanosis and many subjective complaints, the most common of which were headache, a feeling of semisomnolence, dyspnea, nausea, visual disturbances, palpitation and an urge to void on return to ground level. The authors conclude from these observations that if air borne troops are incapacitated secondary to anoxia or hyperventilation at any altitude they are likely to be less capable of violent muscular effort for as long as thirty minutes after experiencing the symptoms.

Syncope Reactions During Simulated High Altitude.

—Romano and his co-workers analyzed the syncope reactions occurring during 754 individual exposures of 51 subjects to a simulated altitude of 35,000 feet. Reduction in oxygen tension was not a factor, since 100 per cent oxygen was supplied from the ground up. The subjects were medical students and physicians capable of self observation. All flights were made at a rate of a climb of 5,000 feet per minute. All exposures were at 35,000 feet, and the maximum duration was three hours. The following symptoms and signs were considered to be manifestations of syncope reactions: weakness (or faintness), dizziness (or lightheadedness or unsteadiness), pallor, sweating, nausea, fall in blood pressure, confusion and unconsciousness. Syncope reactions were recorded 91 times in 37 subjects. There were two main types of syncope: (a) the vasodepressor type (74 cases), characterized by rapid onset, progressive course and symptoms of weakness, nausea, sweating, pallor and hypotension, which were related to posture, and (b) the nondepressor type (11 cases), characterized by recurrent and fluctuating course, flushing and absence of signs of circulatory collapse. Syncope reactions occurred most often in the presence of multiple symptoms of decompression sickness. Chokes were the most frequent precipitating factor. All instances of the nondepressor type followed chokes. The vasodepressor type was precipitated by bends, chokes or abdominal distention, alone or in combination. There was no correlation between a history of syncope and the occurrence of flight syncope. Frequent syncope reactions occurred in subjects susceptible to severe decompression sickness; they were complications of decompression sickness rather than indications of susceptibility to "easy fainting." The responses of 20 subjects to tilting on a tilt table were studied 37 times before and 47 times after flight. Syncope reactions were provoked 6 times by tilting after flight; in 5 instances there had been preceding syncope during flight, and in 3 postural maladaptation of the subjects was still demonstrable two to seven hours later. Elimination of subjects susceptible to decompression sickness would automatically eliminate the great majority of syncope reactions.

West Virginia Medical Journal, Charleston

39:365-396 (Nov.) 1943

- Neurosurgical Procedures for Relief of Pain. C. C. Coleman.—p. 365.
Otolaryngology in General Practice. H. M. Goodyear.—p. 373.
Early Diagnosis of Acute Abdomen. J. A. Soffel.—p. 379.

39:397-432 (Dec.) 1943

- Effect of Anoxia on the Body. E. J. Van Liere.—p. 397.
Treatment of Third Degree Burns. J. S. Klumpp.—p. 406.
Sterility and Artificial Insemination. H. B. Copeland.—p. 415.
Acute-Poliomyelitis and Public Health Regulations. H. A. Swart.—p. 418.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted

British Journal of Radiology, London

16:323-356 (Nov.) 1943

- Radiologic Evidence in Hematite Iron Ore Workers R. Lawitt—p. 323.
Preliminary Note on Planning of Combined Radiotherapy of Carcinoma Cervix Uteri. B. Sandler—p. 331.
Spatial Distribution of Ionization in Irradiated Tissue and Its Relation to Biologic Effects D. E. Lea—p. 338.
Metabolic Effects of Therapeutic Doses of X and Gamma Radiations J. S. Mitchell—p. 339.
Radiology—Empiricism or Science? A. E. Barclay—p. 344.
"Exhaustion" Fracture of Spine: Preliminary Report on One Case. J. B. Hartley—p. 348.
"A Helping Hand": Presidential Address to Faculty of Radiologists R. Paterson—p. 351.
An X-Ray Output Meter. J. E. Roberts and T. T. Farmer—p. 353.
Tomographic Attachment Suitable for Most X-Ray Plants C. H. Goldman—p. 355.

"Exhaustion" Fracture of Spine.—According to Hartley, stress, fatigue or exhaustion fractures occur almost exclusively in weight bearing bones. Before the diagnosis of fatigue or exhaustion fracture can be accepted it is necessary to establish that the affected bone presents otherwise normal radiologic appearances. A boy aged 17 had been driving a coal cart for three years. For the twelve months prior to his admission he had been delivering 1 hundredweight bags of coal. This he did by turning his back to the sack, placing both hands behind his head and pulling the coal bag on to his back, where it rested on his lower cervical and upper thoracic regions. He was admitted to the hospital with a clinical diagnosis of probable Pott's disease of the upper thoracic spine, the diagnosis being based on the history of pain in the upper dorsal region for some three weeks and tenderness to pressure in that area. At the onset no pain was felt in the back; the patient complained of a "throb" experienced in the chest behind the breast bone. This continued for some days, during which he continued with his work. He collapsed suddenly with very acute pain in the dorsal region. The pain was sudden in onset and "tearing" in nature. He was unable to sit upright without assistance. Physical examination revealed that the body of the fifth thoracic vertebra was wedge shaped. On the basis of control films the patient's occupation, age and good general condition and because of absence of pathologic change in the neighboring vertebrae the author diagnosed the condition as stress or compression fracture.

Edinburgh Medical Journal

50:577-640 (Oct.) 1943

- *Wound Infection: Preliminary Note on Combined Clinical and Bacteriologic Investigation of 708 Wounds H. I. De Waal—p. 577.
Hemolytic Anemia L. J. Davis—p. 589.
*Diphtheria in Middle East: Some Observations on 71 Cases T. A. MacGibbon—p. 617.
Hemoglobinometers S. Hay—p. 626.

Wound Infection.—De Waal reviews observations on over 700 wounds. The object was to determine by repeated bacteriologic examinations of wounds their "bacteriologic history" and to ascertain the effect of sulfanilamide and sulfapyridine powder, sulfacetamide, acriflavine, gentian violet, brilliant green, eusol, zinc peroxide, isotonic and hypertonic saline solution and the coagulants tannic acid and silver nitrate plus gentian violet. A few cases were treated with a crude penicillin preparation. On admission to the hospital 189 per cent of wounds contained *Staphylococcus pyogenes* and 13.1 per cent hemolytic streptococci; other pathogens were found in much lower percentage. Although 27 of 708 wounds contained *Clostridium welchii* and other clostridia were found in 31, only 3 patients developed symptoms of gas gangrene. The number of organisms present in wounds on admission to the hospital was directly related to the time following injury: up to six hours the number was small. This emphasizes the need for treating wounds during the first four to six hours. In wounds which had been "cleaned" and dressed all infections were more frequent than in those which had been dressed only with a sterile dressing. Eighty-six per cent of all wounds and 67 per cent of burns became infected during hospital treatment. If rate of healing is

regarded as the criterion of the efficiency, then, with the exception of acriflavine and gentian violet, all the other antibacterial substances used yielded almost equally good results in wounds and in burns. If, however, freedom from infection is regarded as the criterion of efficiency, then, excluding consideration of penicillin, the flavines are the best. Acriflavine controls gram positive organisms and to a lesser degree gram negative types but delays the healing process. Repeated applications of acriflavine rendered many wounds sterile in three to five days. Early application of flavine appears to be a logical method of rendering wounds bacteriologically clean. After four or five days another antiseptic substance should be substituted. At this stage, with a relatively clean wound, the sulfonamides appear suitable.

Diphtheria in the Middle East.—MacGibbon says that among the 11,097 patients who passed through a hospital in Egypt there were 71 with diphtheria. Forty-nine persons with faucial and pharyngeal diphtheria were seen. Of these, 17 made uneventful recoveries but 32 developed complications. Only 2 cases of laryngeal diphtheria were seen. There were 8 cases of nasal diphtheria, in 4 of which complications developed and in 4 recovery was uneventful. Twelve cases of non-respiratory diphtheria were seen. It was noticeable that any form of wound, desert sore, ulcer, burn or skin lesion was liable to become infected with *Corynebacterium diphtheriae*. The lesions which did become infected with *C. diphtheriae* were 3 chronic pulp infections of the finger, 1 chronic ulcer of the buttocks, 1 chronic ulcer of the abdominal wall, 1 chronic multiple desert sore, 1 compound fracture of the tibia and fibula, 1 chronic infected second degree burn of the feet and 4 cases of chronic suppurative otitis media. Three of these cases were not diagnosed until the appearance of polyneuritis. Of the 12 cases there were complications in 5, a fatal outcome in 1 and uneventful recovery in only 6. Peripheral neuritis was the commonest complication. It was often extremely severe and debilitating. In 17 out of a total of 19 cases it involved several cranial nerves, also most of the muscles of the limbs, trunk and abdomen. Myocardial involvement occurred in 17, or 23.9 per cent, of cases. The dose of antitoxin needed to control the membrane and the toxemia seemed to be higher in Egypt than that needed in Great Britain. The author has seen up to 196,000 units given to 1 patient within three days. The average was 40,000 to 50,000 units, and in severe toxic cases from 50,000 to 100,000 units. The cutaneous type of diphtheria is easily overlooked and, as a result, insufficient antitoxin is given. It is suggested that antitoxin be combined with toxoid or that military personnel be actively immunized against diphtheria.

Lancet, London

2:561-592 (Nov. 6) 1943

- Treatment and the Patient. L. Cole—p. 561.
Splinting of the Femur Fractured by Gunshot Wound Tobruk and Double Cuff Plaster. J. D. Buxton—p. 564.
*Water-Pitressin Test in Diagnosis of Epilepsy. H. G. Garland, A. P. Dick and C. W. M. Whitty—p. 566.
Inhibition of Penicillin in Routine Culture Mediums G. J. Harper—p. 569.
Intra-Arterial Injection of Pentothal: A Warning R. R. Macintosh and P. S. A. Heyworth—p. 571.
Concentration of Sulfapyridine in Bile Nancy Gough—p. 571.

Water-Pitressin Test in Diagnosis of Epilepsy.—According to Garland and his collaborators the diagnosis of epilepsy is rarely a matter of urgency in civil life, but in the army it must be made quickly. A rapid method of establishing the presence of epilepsy is of value. The electroencephalogram provides such a test, but it is not always available nor are its results always conclusive. Hyperventilation, small doses of metrazol and the ethyl chloride spray test have on the whole proved unreliable. The water-pitressin test has been found more satisfactory by most workers. The authors used it in 96 cases, including 20 controls. The patient was kept in bed on a normal diet throughout the test and for twenty-four hours after it. A pint of water was given hourly from 7 a. m. until the test was discontinued, usually after 11 pints. Posterior pituitary injection was given hourly from 10 a. m., the doses being 0.2, 0.3, 0.4 and 0.5 cc., followed by four doses of 0.5 cc., a total of eight injections. The patient was weighed repeatedly. The blood pressure was measured two hourly or more frequently.

if there were definite fluctuations. Fluid given included water, lemonade, milk and ovaltine. All fluid intake and output, including urine and vomitus, was measured; this gave a further check on water retention apart from the weight change. The test was stopped if a fit occurred and 1 grain (0.06 Gm.) of phenobarbital was given by mouth. It was stopped also if there was severe vomiting, abdominal discomfort or persistent headache. The authors consider the test of value since in about 40 per cent of the epileptic the diagnosis of epilepsy may be established at once. They stress the importance of careful and continuous observation, with particular reference to general condition and blood pressure. Under these conditions the test seems to be free from risk. It has never induced a fit in a person who was not epileptic. Its usefulness is demonstrated by the results of investigation of 96 patients. Of 44 with epilepsy, 17 (39 per cent) had a fit during the test. Of 32 with doubtful epilepsy, 12 (38 per cent) had a fit. Of 20 controls with hysterical personality, none had fits.

Revista de la Sociedad de Pediatría de Rosario

8:99-209 (May-Aug.) 1943. Partial Index

So-Called Cyst of Meniscus: Case in Child 4 Years Old. C. Infante and C. Santervas.—p. 99.

*Blood or Plasma Transfusion in Infants: New Route. R. F. Pinto.—p. 108.

*Poliomyelitis: Therapy. C. Infante.—p. 152.

Blood Transfusion in Infants.—Pinto discusses the value of the peripheral veins (the facial on the forehead, the veins of the dorsum of the hand, and those of the palmar aspect of the wrist and of the thumb) for blood or plasma transfusion in infants. These peripheral veins have advantages over all other routes previously used, including the longitudinal venous sinus and the bone marrow. The technic is simple and the procedure is harmless. The only contraindications are general edema, acute burns and increased fragility of the capillaries, which are rare. In the departments for transfusion of two pediatric clinics of Buenos Aires 1,000 transfusions of either blood or plasma were satisfactorily carried out utilizing the peripheral veins of infants. Contraindications were present in 10 cases.

Poliomyelitis.—Infante advises postural immobilization of one or both limbs and the thorax in splints or in casts as soon as paralysis appears and through the paralytic period, a segmental immobilization of the paralyzed segments or of the thorax alternating with or followed by physical therapy and muscular reeducation during the period of regression of paralysis and orthopedic correction for permanent sequels. The Lorenz bed for immobilization of the trunk is used in cases of paralysis of the trunk. The shoulder is immobilized in abduction of 60 degrees or more, the elbow in flexion of 90 degrees, the forearm in intermediate position with the wrist in moderate dorsal extension, the hip joint in extension and moderate abduction, the knee joint in extension and the foot either at an angle of 90 degrees or in moderate equinus posture of 100 or 110 degrees. Early orthopedic therapy prevents stretching of the normal muscles, improper posture of the structures and muscular contraction.

Archiv für Kinderheilkunde, Stuttgart

126:65-112 (June 30) 1942

*Chemotherapy of Acute Nephritis. S. Gaál.—p. 65.
Detection of Mentally Defective Children. H. Krenek.—p. 72.
Treatment of Epidemic Meningitis with Sulfapyridine. Sibill-Marie Hesemann.—p. 84.
Diphtheritic Croup. E. Keyser.—p. 96.

Chemotherapy of Acute Nephritis.—At Gaál's clinic bed rest and Noorden's renal diet are generally employed for children with nephritis. A group of 41 children was treated with bed rest and diet only; a group of 26 children was given sulfonamides in addition. It appeared that sulfonamide preparations can be given without danger to the kidney during any stage of acute, nontoxic nephritis. The sulfonamides are particularly effective in bacteriogenic nephritis, especially in forms caused by cocci. In these cases they greatly accelerate the cure. Renal complications are apparently no more frequent than when sulfonamides are administered for extrarenal processes. Apparently renal disease as such does not necessarily signify a predisposition to the secondary renal effects of the sulfonamides.

Klinische Wochenschrift, Berlin

21:581-600 (June 27) 1942. Partial Index

*Storage of Identical Coccus-like Formations in Endothelial Cells of Skin, Mucosa and Lymph Nodes in Mycosis Fungoides. Streptococci Sepsis, Scarlet Fever and Experimental Streptococcal Infections. J. H. Tornack.—p. 581.

*Action of Large Doses of Diethylstilbestrol on Pregnant Organism. B. Belonoschkin and W. Bragulla.—p. 583.

Some Defects in Determination of Ascorbic Acid in Urine. L. von Dobszay.—p. 589.

Coccus-like Formations in Endothelial Cells in Infections.—Involvement of the skin in many systemic diseases caused by micro-organisms suggested the search for defense mechanisms in the skin. Tornack encountered peculiar endothelial changes in the skin and lymph nodes of patients with mycosis fungoides. The endothelial cells, usually with a well preserved nucleus, contained dense colonies of coccus-like formations. The coccus-like forms were sharply outlined and assumed a deep red-violet color on staining according to Pappenheim or with Giemsa's solution. The author observed endothelial storage of these coccus-like forms also in a patient with streptococcal sepsis, in guinea pigs infected with streptococci, in exanthem, enanthem and lymph nodes of scarlet fever patients and even in their capillary endothelium. He is convinced that these formations play a part in the defense against infection. Similar endothelial changes have been observed in the abdominal skin of patients who died from epidemic or tuberculous meningitis, agranulocytosis and diphtheria, as well as in the lungs of mice infected with pneumococci.

Action of Large Doses of Diethylstilbestrol on Pregnant Organism.—Belonoschkin and Bragulla administered dipropionate of diethyl dioxy stilbene intramuscularly to 12 women hospitalized for interruption of pregnancy or with threatened abortion. Small doses were given in the beginning, but gradually they were increased up to extremely large doses. The high doses were accompanied by subjective complaints of restlessness, insomnia, vertigo, nausea, pains in the lower part of the abdomen and increased urge to urinate. Abortion was never favored by the diethylstilbestrol. The sedimentation speed of the erythrocytes became noticeably increased. This is ascribed to an intensified function of the reticuloendothelial system. The placentas of the treated women showed increased fibrinoid necrosis and hyperemization. It is probable that the biologic action of the synthetic estrogenic substance differs from that of the natural hormone. Some of the women were reexamined from nine months to one year later; all were well and free from menstrual disturbances.

Zentralblatt für Chirurgie, Leipzig

69:897-928 (May 30) 1942. Partial Index

*Läwen's Method of Chiseling off of Condyles in Phlegmons of Knee Joint, Particularly After Gun Shot Wounds. W. Hetzar.—p. 897.
Percutaneous Reduction of Fractures with Particular Consideration of Fractures of Head of Radius. J. Hohenwallner.—p. 909.
Further Experiences with Nailing in Marrow. H. Sprengell.—p. 911.
Should Nailing Be Done in Patients with Tubercles and Median Fracture of Neck of Femur? R. Rauhs.—p. 912.
Technic of Amputation. H. J. Lauber.—p. 918.
Amputation with Skin, Fascia and Muscle Flaps. P. Müller.—p. 921.

Chiseling off of Condyles in Capsular Phlegmon of Knee Joint.—Hetzar reviews 32 cases of gun shot wounds of the knee joint, in 10 of which a capsular abscess developed. In these 10 and in 2 additional patients observed earlier the condyles were chiseled off according to Läwen's method. The chiseling off of the condyles is not difficult. The majority of the wounded retain a stiff knee after this operation. The aim must be to obtain an ankylosis in as favorable a position as is possible. Exact immobilization is therefore of greatest importance. If a partial resection such as chiseling off of the condyles is capable of controlling articular suppuration, other more extensive methods can be avoided. The total resection, which is still widely used in the presence of a capsular abscess, results always in a greater shortening of the stiffened leg than is the case after the removal of the condyles. A certain function of the knee is retained occasionally after Läwen's operation, for injury to the cruciate ligaments is carefully avoided. Chiseling off of the condyles makes possible saving of the extremity even in progressive suppuration in the thigh and leg.

Book Notices

War Endocrinology. By James H. Hutton, M.D. Cloth. Pp. 363. Chicago: Wayside Press, 1943.

The use of the word "war" in the title has no significance, unless it is used to indicate that it was published in wartime. In the preface the author says "This is not a complete text on endocrinology; it will have no value to the endocrinologist." This statement is hardly true, for the volume contains much information, both pro and con, which will give an endocrinologist considerable food for thought. It does not seem sufficiently fundamental for one not experienced in endocrinology to gain a basic knowledge of the subject. The author stresses the clinical evidences of endocrinology rather than the scientific. In the introduction (page viii) he states that "There are still a few basic facts, tested clinically, which can be helpful to the practitioner whose training antedated the rise of this specialty." One can agree with the author on this point, as there has been a tendency for a number of years to overlook the development of keen clinical sense. The book is devoid of references; therefore one cannot investigate the authority for many statements or the authenticity of them. The absence of references precludes the possibility for supplemental reading. The various glands and their disorders are discussed in a conversational style; the book is easy to read. Much attention has been given to treatment, which is always difficult and often discouraging in any specialty of medicine. The material contained in the book is interesting in that it combines past knowledge on the subject, which is chiefly clinical, with some of the present, which is biochemical.

Pictorial Life History of the Apothecary Chemist, Carl Wilhelm Scheele. By George Urdang, Ph.G., D.Sc.Nat., Director of the American Institute of the History of Pharmacy, Madison, Wisconsin. Published under the Auspices of The American Institute of the History of Pharmacy and The American Pharmaceutical Association. Paper. Pp. 71, with illustrations. Madison, Wisconsin, 1942.

Under the auspices of the American Institute of the History of Pharmacy and the American Pharmaceutical Association, the life history of Carl Wilhelm Scheele, apothecary chemist of the eighteenth century, has been presented in booklet form by George Urdang, director of the institute. The booklet is a tribute to this outstanding apothecary and to the pharmacy profession, a tribute which reveals the true status of early pharmacy. In addition to presenting an outline of Scheele's activities, discoveries and recognitions, the booklet offers many pictures pertaining to his life, associates and the districts in which he lived. His achievements include the discovery of chlorine, manganese, oxygen, ammonia, many acids, and the purification and identification of numerous chemical compounds, all of which clearly demonstrate this man's curiosity and research and the valuable practical applications that followed his discoveries. It is a tragedy that death terminated at the age of 44 years the career of a man who contributed so much to chemistry and pharmacy.

Die Thrombozyten des menschlichen Blutes und ihre Beziehung zum Gerinnungs- und Thrombosevorgang. Von Prof. Dr. med. A. Fonta, Professor für Chirurgie an der Universität Bern, und Dr. med. J. Schwendener. Cloth. Price, 9.60 francs. Pp. 130, with 112 illustrations. Bern: Medizinalischer Verlag Hans Huber, 1942.

This monograph is devoted to a study of the role of the blood platelets in blood coagulation and thrombosis by means of the microscopic observation with the dark field microscope. The first section of the monograph is concerned with a detailed morphologic study of the platelets using fresh blood which had been cooled to 1 C. and centrifuged. A drop of plasma was put under the dark field microscope and the morphologic changes in the platelets were observed and recorded by photomicrographs. The authors describe several forms of platelets and ascribe different biologic significance to them. They contend that the blood platelet consists of two parts which behave quite differently from a functional aspect. The granules of the platelet take over the function of the nucleus of the cell and are associated with fibrin formation, whereas the protoplasm or its pseudopods has the adhesive function in rough places which have a thromboplastic function. The authors discuss the behavior of the blood platelets in the process of coagulation and thrombosis in the second section of the monograph. A

detailed account of their technic and results is not possible in a review of this type, but the work is well documented with a detailed explanation of technics employed and changes observed. The inclusion of 112 illustrations, practically all of them photomicrographs of the morphologic alteration of the platelet under the dark field microscope, aid one considerably in visualizing the descriptive material in the text. The material is highly provocative though speculative. However, considering the excellent previous work done by the authors in this field of investigation the material merits serious consideration. The monograph will be of particular interest to those interested in hematology, physiologic chemistry and vascular surgery. It is an important contribution to investigators concerned with the problem of blood coagulation.

Lincoln-Douglas: The Weather As Destiny. By William F. Petersen. Cloth. Price, \$3. Pp. 211, with illustrations by Jean McConnell. Springfield, Illinois & Baltimore: Charles C Thomas, 1943.

"If the conscious reaction was so obviously governed by the subconscious, and the subconscious so evidently conditioned by the state of the total personality, or the environment, or the weather, we can assume that much in the background of what was seemingly 'mysterious' in Lincoln is to be sought in the unusual development of these relatively intangible mechanisms of the autonomic nervous system, and particularly the lower brain centers." This paragraph from Dr. Petersen's book pretty well characterizes its contents. According to him, all human acts are greatly influenced by the total personality, the ancestry and especially the weather. The latter, in turn, is influenced by the sun spots; however, leading men and great events do not reflect the sun spots but the cosmic rhythm of the sun spot cycle.

The author has selected three persons to demonstrate his theory: Lincoln, Mrs. Lincoln and Douglas. The book does not pretend to bring new historical facts; its scope is limited to a novel interpretation of facts already known. The author's division of human beings into slender and broad bodies is rather elementary and far from original. Textbooks in phrenology have followed this line of demarcation for a century and have done so more fully by separating people into three temperaments instead of two—the motive, the vital and the mental—and by recognizing that these three temperaments are usually represented in varying proportions. This chapter is the weakest part of the book, and its quasipopular presentation does little to improve it. The remainder of the volume is devoted to the development of Dr. Petersen's main theory, but while he makes out a plausible case for it the number of persons and destinies on which it is based make deductions hazardous.

A few more paragraphs may serve to illustrate the author's views in regard to the unseen influences at work in history:

If Abraham Lincoln's wife and his four children, if his father and step-mother died with sun spot crests they did not die because the sun spots killed them. They died because the energy demand of the immediate environment had been greater than the supply that was available.

If both a depressed and discouraged Lincoln and a depressed and discouraged Tennyson terminated engagements to marry at the same time; if both Darwin and Tennyson were seriously exhausted physically and mentally and reached their nadir of illness in the years 1847 and 1848; if Darwin fashioned his scientific monument and Tennyson his greatest literary masterpiece and Lincoln reached his political goal and Gladstone assumed leadership of the House of Commons all in the period from 1856 to 1860 when solar turbulence rapidly increased, then human episodes are not just chance, the common environment fashions the background. These unusual characters could seize the opportunity, could respond to the cosmic vibration and achieve the height of fame.

If Lincoln's father, and Darwin's father, and Gladstone's father died at approximately the same time, the statisticians will surmise that they died because they were all of approximately the same age, but that does not account for the fact that Lincoln's boy and Darwin's daughter and Gladstone's daughter died at the same time as their grandfathers! These old and young humans died because the environmental strain was enhanced the world over—and with greater strain these frailer vessels couldn't go along, the old and the young being more sensitive than the group in between. The turbulence of the sun did not kill them; defective hearts and impaired kidneys and the ever ready world of micro-organisms were most likely the direct causes.

Theories such as Dr. Petersen's should be treated with tolerance and met with encouragement. Even if not proved, they may contain the kernel of a worthwhile truth. This book would have been more convincing if the subject had been treated less onesidedly, less like a lawyer's brief and more like a clinical report. As a basis for new research the subject is not without interest, but thus far the author has scarcely begun his work.

If he fails in his mission to gain converts it is because he has tried to demonstrate by means of insufficient evidence what may or may not at some future time be accepted as a new and important factor in shaping historical events.

An Introduction to Medical Mycology. By George M. Lewis, M.D., Assistant Professor of Clinical Medicine (Dermatology), Cornell University Medical School, New York, and Mary E. Hopper, M.S. Second edition. Cloth. Price, \$6.50. Pp. 342, with 79 illustrations. Chicago: Year Book Publishers, Inc., 1943.

When this volume appeared in its first edition in 1939 it filled a definite need in the medical and, in particular, in the dermatologic literature. The necessity for a second edition at this time is evidence of the great popularity which it quickly and justly acquired. It is therefore all the more regrettable that many of the items which were subjected to criticism in the review of the first edition in *THE JOURNAL* remain unchanged. However, in other respects the second edition has been brought up to date and represents an improvement over the standard achieved in the first edition.

The new edition contains additional excellent illustrations, including some color plates showing the characteristic hues of certain types of fungi in culture. There are also new sections dealing with tinea nodosa, histoplasmosis, rhinosporidiosis and mycoses of the lungs. More information has been added on immunologic procedures such as the coccidioidin, blastomycin and sporotrichin skin tests; the passive transfer technic has been given in greater detail. In the reviewer's opinion the camphor-phenol treatment of fungous diseases is rightly condemned as unnecessarily hazardous.

Pityrosporon ovale has been shifted from the chapter on "questionably pathogenic fungi" to the chapter on "probably pathogenic fungi." The wisdom of this shift as well as of the statement "that there is as much if not more proof of causal relationship between *P. ovale* and dandruff as between *M. furfur* and tinea versicolor" may be doubted. Many observers will likewise disagree with the opinion that "it is unlikely that fungous disease would supervene on a contact dermatitis."

While statements such as those just listed may be subjected to challenge, "An Introduction to Medical Mycology" is, in its field, the most useful book available to the student, the general practitioner and the dermatologist.

Reconstructive Surgery of the Eyelids. By Wendell L. Hughes, M.D., F.A.C.S. Cloth. Price, \$4. Pp. 160, with 198 illustrations. St. Louis: C. V. Mosby Company, 1943.

This monograph is a thesis presented for admission to the American Ophthalmological Society. It is strictly limited in scope to the subject designated by the title but within these limits is truly exhaustive. There are 451 references to the literature, and the development of various procedures for reconstruction of the eyelids, from the earliest times to the present, is described. The author illustrates the methods favored by him in 20 case reports. The influence of the teachings of Wheeler is evident throughout. Practically all the cases shown involve the lower eyelid. While probably lower lid lesions and defects are by far the more common, yet one would welcome authoritative advice on the repair of the occasional upper lid defect. Twelve of the case reports illustrate the author's method of partial or total reconstruction of the lower lid by utilizing the tissues of the upper lid. This work is not to be regarded as a systematic textbook on eyelid surgery but is an excellent presentation within the limits set by the author. It is hoped that the success of the book will encourage the writer to publish later a more comprehensive volume dealing with reconstruction of all the orbital structures.

Biomicroscopy of the Eye: Slit Lamp Microscopy of the Living Eye. By M. L. Berliner, M.D., Assistant Professor of Clinical Surgery (Ophthalmology), Cornell University Medical College, New York. Volume I. Cloth. Price, \$17.50. Pp. 709, with 512 illustrations. New York & London: Paul B. Hoeber, Inc., 1943.

This book on slit lamp microscopy of the living eye is the first written in English by an American on this subject. The first two chapters, consisting of 110 pages, are devoted to a thorough description of the various types of slit lamps in general use, including the latest by Comberg and Poser, and include the mechanics and physics of the illuminating systems. The second chapter describes the technic of biomicroscopy and should be invaluable to the ophthalmologist using the slit lamp.

There are six chapters devoted to the conjunctiva, eyelids and sclera. The various lesions of the cornea are covered in the next six chapters. One chapter is devoted to the anterior chamber. The last chapter, consisting of 59 pages, deals with gonioscopy and was written by Dr. H. Saul Sugar. It is the most comprehensive thesis on this subject in English to date. The illustrations are clear and instructive. The forty colored plates each contain from five to eight figures in full eight color plates and are beautifully done. They enhance the value of the book materially. The print is large and easily readable, while the text is clear, comprehensive and well written, and the illustrations add a great deal to the simplification and clarity of this complicated subject. This book is a combination of clinical guide, textbook and atlas on slit lamp examination of the living eye. The bibliography is extensive and should meet the requirements for further study of any reader. The biomicroscopy of the iris, lens and vitreous is to be covered in a separate volume. This book should be well received by all English reading ophthalmologists because of its clear text and beautiful colored illustrations, and because it admirably fills a gap in the ophthalmic literature.

A Textbook of Exodontia: Exodontia, Oral Surgery and Anesthesia. By Leo Winter, D.D.S., M.D., F.A.C.D., Professor of Oral Surgery, New York University. Fifth edition. Cloth. Price, \$10. Pp. 576, with 492 illustrations. St. Louis: C. V. Mosby Company, 1943.

The present edition of this standard and well accepted book is a revision of its predecessor and is received with the continued favor which it justly deserves. It is a practical textbook of exodontia and anesthesia designed for the use of the student and practitioner of dental and oral surgery. Detailed description of applied surgical technic is one of the important attributes of the book.

The subjects of local and general anesthesia for oral surgery are adequately discussed, and the chapter on local anesthesia has been completely revised. Monocaine hydrochloride is given special consideration. In the treatment of pathologic conditions which contraindicate intraoral anesthesia, and operative procedures which require anesthetization of the skin surface as well as the jaws, emphasis has been placed on extraoral technic. The addition in this edition of color plates of drawings from original laboratory specimens illustrate the regional anatomic structures through which the needle passes in reaching the mandibular and maxillary nerve trunks.

General anesthesia is again presented in this edition by Emery Andrew Rovenstine, M.D., professor of anesthesia, New York University College of Medicine and College of Dentistry, and director Division of Anesthesia, Bellevue Hospital, New York. Notable additional material in this book is also the new chapter on general anesthesia for ambulatory dental patients by Anthony S. Mecca, D.D.S., assistant professor of oral surgery, New York University College of Dentistry; associate visiting dentist, Bellevue Hospital.

Other chapters on supplementary and related subjects include accidents and infections following local anesthesia, prevention and treatment of bleeding, and notably the new chapter on chemotherapy.

The author, whose eminence and ability in the field of oral surgery are well recognized, has admirably achieved the purpose for which this edition was revised and has successfully brought up to date a subject which is an important contribution to the literature.

Food Inspection Notes: A Handbook for Students. By H. Hill, F.R. San.I., F.S.I.A., A.M.I.S.E., Sanitary Inspector, Borough of Southgate, and E. Dodsworth, M.R. San.I., M.S.I.A., Sanitary Inspector, Borough of Edmonton. Fabrikoid. Price, 6s. Pp. 121. London: H. K. Lewis & Co., Ltd., 1943.

Owing to the extent of the subjects covered in such a small volume, the consideration given to the various phases of food inspection is necessarily limited. In the chapters dealing with postmortem meat inspection and the recommended disposition of diseased carcasses, considerable variation is noted from those found in the regulations of the United States Department of Agriculture, Bureau of Animal Industry, which is the American standard. Variance from this standard is also frequently noted in the consideration of other food products. The book contains some material that should be helpful to a student of this subject.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

PRACTICAL PREGNANCY TESTS

To the Editor:—Please tell me the most up to date and reliable test for pregnancy and the technic. Is it of such a nature that it can be done satisfactorily by a country practitioner?

Robert F. Thomas, M.D., Sevierville, Tenn.

ANSWER.—The two most practical and most reliable tests for pregnancy are the original Aschheim-Zondek and the Friedman test. Of these the Friedman test is the most practical for the country practitioner.

A young female rabbit that is virginal or that has been segregated is used for the test. A first morning specimen of urine is collected, after fluids have been restricted the previous evening to give a greater concentration of hormones, in a clean bottle. It is filtered. Dilute 15 cc. of the urine with an equal amount of isotonic solution of sodium chloride. Inject 15 cc. of this mixture into the ear vein of the rabbit and inject the remaining 15 cc. eight to twelve hours later. Twelve hours after the second injection the animal is anesthetized and the abdomen opened. If this is done under aseptic precautions, the rabbit may be closed and it will be available for use, after a four week period of isolation, for further tests. At present, with a scarcity of rabbits, this is a valuable point in conservation.

The ovaries of the rabbit are located. A positive pregnancy reaction is manifested by the finding of ruptured corpora lutea plus the presence of hemorrhagic follicles. Absence of such findings constitutes a negative test, but because some rabbits are refractory to the action of the gonadotropic hormones a control must be run before a true negative test reaction can be reported. To do this the abdomen is closed and another series of injections is done in the same manner as the first, using for the control urine from a patient who is known to be pregnant. If a negative reaction is obtained on again opening the rabbit, that animal is refractory. If the second test produces a positive reaction, the original urine was from a nonpregnant patient and the original test can be reported as negative. The test is about 98 per cent accurate.

If one wishes, blood serum may be used instead of urine, but the technic of the test is the same.

EFFECT OF BUFFER SOLUTIONS ON HUMAN BODY

To the Editor.—What harmful effect, if any, can the use of "buffer" solutions, such as the phosphates, tartrates, carbonates and phthalates, have on the human body? I am particularly interested in information regarding the influence of strongly buffered solutions in the pH range of 8 and higher. Any direction to literature will be appreciated.

M.D., Kentucky.

ANSWER.—When taken by mouth, phosphates and tartrates are absorbable with difficulty and act therefore as typical saline cathartics. Phthalates do not appear to have been used therapeutically. Carbonate solutions are too strongly alkaline to permit of internal use, but in combination with carbonic acid as the bicarbonate they have been extensively employed as an alkalinizing agent to measure and combat acidosis and to neutralize the hydrochloric acid of the gastric juice.

However, it would appear that the inquirer is primarily interested in the use of the "buffer" solutions named for parenteral administration. The intravenous or intraperitoneal use of such alkaline buffers would be fraught with many dangers, such as the development of alkalosis and tetany. The introduction of strongly buffered alkaline phosphate solution into the blood stream would lead to a reduction in the ionized calcium of the blood and to tetany, as would also the administration of the tartrate. Furthermore, the tartrates are toxic in other ways, producing renal injury and muscular and nervous symptoms.

Potassium acid phthalate is used in the laboratory as a primary standard in the preparation of standard acid and alkali solutions and in the Clark and Lubs series of buffers (over the range pH 2.2-6.2) for colorimetric pH work. While salts of phthalic acid apparently possess much lower toxicity than phenolphthalein and its many derivatives, there would not appear to be experimental justification for the parenteral introduction of phthalates into the body.

Sodium carbonate is too strongly alkaline to be employed for any internal therapy, oral or parenteral. While it is possible to prepare and use a solution somewhat more alkaline than sodium bicarbonate, it seems questionable whether anything would be gained by so doing. It would be more logical to use a little larger quantity of sodium bicarbonate. Since the buffers of the body act through the bicarbonate, all that can be accomplished can be secured through the use of sodium bicarbonate or sodium bicarbonate in combination with sodium chloride, the object of course being to aid in maintaining a normal electrolyte and water balance.

Buffers are discussed by Peters and Van Slyke (Quantitative Clinical Chemistry, Baltimore, Williams and Wilkins Company, 1931, vol. 1, Interpretations, p. 888), but more general information on the other points raised can be found in the recent editions of Sollmann's Manual of Pharmacology and Its Application to Therapeutics and Toxicology (ed. 6, Philadelphia, W. B. Saunders Company, 1942).

TUBERCULOSIS AND ANTISYPHILITIC THERAPY

To the Editor.—Kindly discuss antisiphilitic therapy in latent and active tuberculosis. Is the twenty-six weeks routine of the Army, with its emphasis on mapharsen twice weekly, more likely to provoke a flare-up of tuberculous disease than the less intensive therapy in general civilian use a year or two ago? A patient with normal chest x-ray appearances two years ago developed a penile sore, darkfield positive, in May 1942 and received routine therapy. In August 1943 he developed a sore of the lower lip in which Treponema pallidum was demonstrated, and he was put on routine therapy again. Soon after hemoptysis and x-ray evidence of active parenchymal disease of the lung appeared suddenly. What opinion can be given as to the correctness of interpreting this sequence as cause and effect?

Captain, M. C., A. U. S.

ANSWER.—There is undoubtedly a certain amount of risk in activating a latent tuberculosis when intensive treatment for syphilis is employed. On that account in one clinic where much intensive therapy has been used in the last two years it has become customary to take a routine x-ray film of the lungs before instituting the treatment. Is it possible in the interim between the first course of treatment and the second course of treatment that the patient may have had a massive exposure to tuberculosis? That seems the only way in which this situation can be explained.

Undoubtedly every person who is going to receive intensive therapy should have not only a careful physical examination but an x-ray examination of the lungs to rule out a latent tuberculosis.

CORNEAL TUMORS

To the Editor.—Is there any comprehensive review or any information of value concerning corneal tumors of the functioning lacrimal gland? I have recently removed a fifteen year duration tumor from a cornea, and complete sectioning reveals a normal lacrimal gland complete with a normal duct. It is my impression that this occurrence is of sufficient rarity that this incident should be recorded.

Major, M. C., A. U. S.

ANSWER.—As far as a cursory search of the literature reveals, a corneal tumor that consists of a normal lacrimal gland and lacrimal duct is in a class by itself. The impression is that such a tumor is a dermoid and should contain other structures. Corneal dermoids are not too unusual and hence are not commonly sectioned and reported.

References:

- von Hippel, in Henke Lubarsch: Handbuch der speziellen pathologischen Anatomie und Histologie 2, part 1, p. 369.
- Van Duyse, in Traité d'ophtalmologie de la Société française d'ophtalmologie 1: 1041, 1939.

POLYCYTHEMIA VERA

To the Editor.—In Queries and Minor Notes (The Journal, Nov. 13, 1943, p. 743) is an answer to a query on polycythemia vera in which you enumerate four different forms of treatment of this disease. The reply fails to mention one of the most successful recent treatments of the disease carried out by Dr. Lowell A. Erf of the Jefferson Medical College of Philadelphia. Dr. Erf published several articles on the subject of treating polycythemia with intravenous injections of phosphorus previously subjected to the cyclotron treatment in California. I can speak on the subject from personal experience, because my son, whose red blood cell count had been up to 9,200,000 and whose hemoglobin was 136, had three intravenous injections in Philadelphia about a year and a half ago. His red blood cell count after the third injection went down to 2,800,000, when small quantities of liver extract were administered and the red count has remained around 4,000,000 ever since. All treatments previous to Dr. Erf's administration, such as irradiation, acetylphenylhydrazine and phlebotomies, were unsuccessful.

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[Radiophosphorus is not commercially available and the treatment, although promising, is still experimental, and for these reasons it is not now recommended for general use.—Ed.]

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WAR AMENORRHEA

A CLINICAL AND LABORATORY STUDY

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Soon after our arrival at the Santo Tomas Internment Camp in Manila, Philippines, on Jan. 4, 1942 a high incidence of amenorrhea was noticed. In the middle of June there were 3,134 internees, of whom 1,172 were women. All but 26 of the latter were American or British. Of the 1,172 there were 1,042 between the ages of 14 and 45 years. By April it was evident that the high incidence of amenorrhea had persisted and among the 1,042 women of menstrual age we were able to find 125 patients with amenorrhea which had developed since the outbreak of the war. Many complained of irregular menstrual periods, but only a few patients suffering from menorrhagia were seen. The menses returned in many instances after several months' absence. Another illustrative group was the army nurses who went through the campaigns of Bataan or Corregidor and were interned on July 2. Of the 60 nurses interned, 14 had amenorrhea, 7 dysmenorrhea, 5 menorrhagia and 4 irregular menstrual periods. Menstrual disturbances were therefore present in 50 per cent and amenorrhea in 23 per cent of the nurses, while in the appropriate age group in the camp as a whole the incidence of amenorrhea was 14.8 per cent. It was suspected that the cause of the amenorrhea was an endocrine one, and in spite of the shortage or absence of some reagents and laboratory animals, which limited quantitative determinations, it was decided to attempt to investigate the cause of this condition.

ETIOLOGY

Secondary amenorrhea is seen in women who have menstruated for a varying length of time. The term functional amenorrhea means that menstruation has ceased although both the uterus and the ovaries are apparently normal. The causes are many and include malnutrition, endocrine disturbances especially of the anterior lobe of the hypophysis, the wasting diseases, chronic intoxications, emotional disturbances and certain neuroses and psychoses. However, we are concerned here with amenorrhea as associated with war.

The widespread prevalence of amenorrhea in central Europe during and after the first world war called forth considerable comment there but is scarcely mentioned in the French, British or American literature. Von Jaworski¹ of Warsaw in 1916, the first to report his observations on this condition, thought it was due to poor nutrition and disturbances in metabolism. Dietrich² of Göttingen in 1917 recognized the association of the increased incidence of amenorrhea with the war and suggested in the German medical literature the name "kriegsamenorrhoe" or war amenorrhea, which term is commonly used. He considered malnutrition and hard work the most important of its causes, with psychic influences as a secondary factor. From Berlin, Bakofen³ reported his observations on war amenorrhea. He and others suggested that the consumption of grain containing ergot may have caused amenorrhea through its prolonged influence of contraction of the uterine blood vessels, but no instances of ergot poisoning or gangrene were mentioned. He was not impressed with the possibility of psychic influences. Von Lingen⁴ studied 320 patients with this disturbance in Leningrad and thought the causes were poor food and hard work. He agreed with others that the improper diet caused cessation of ovarian secretion which resulted in amenorrhea. Nilsson⁵ of Stockholm thought this condition in Sweden was due to faulty diet and especially to the lack of milk and the unfavorable proportions of the various physiologic salts. Teebken⁶ of Kiel made an extensive study of 375 patients with amenorrhea occurring from 1916 to 1919 and an additional 120 cases from 1920 to 1926. He concluded that the prolonged deficiency of protein and also fat was the most important cause and that other factors such as a psychic insult, increase in hard work and sexual abstinence had little to do with it. Graff and Nowak⁷ of Vienna found that lack of protein was the principal cause of the war amenorrhea. It is evident from the foregoing that the European writers considered that the most important cause of the amenorrhea of World War I was a deficiency in one or more of the essential food factors.

In many of our patients the menses stopped abruptly after the first bombing of Manila or soon after internment and before a food deficiency could have any effect. We must therefore look for another cause. This study continued for several months after the

1. von Jaworski, J.: Mangelhafte Ernährung als Ursache von Sexualstörungen bei Frauen, *Wien. klin. Wchnschr.* 29: 1068 (Aug. 24) 1916.
2. Dietrich, H. A.: Kriegsamenorrhoe, *Zentralbl. f. Gynäk.* 41: 157 (Feb. 10) 1917.

3. Bakofen: Kriegerserscheinungen in Gynäkologie und Geburtshilfe, *Deutsche med. Wchnschr.* 45: 212 (Feb. 20) 1919.

4. von Lingen, L.: Kriegsamenorrhoe in Petersburg, *Zentralbl. f. Gynäk.* 45: 1247 (Sept. 3) 1921.

5. Nilsson, A.: Ueber sogenannten Kriegsamenorrhoe, *Zentralbl. f. Gynäk.* 44: 876 (Aug. 7) 1920.

6. Teebken, G.: Amenorrhoe in der Kriegs- und Nachkriegszeit: Ein Rückblick im 10 Jahre nach dem Kriege, *Zentralbl. f. Gynäk.* 52: 2966 (Nov. 17) 1928.

7. Graff, E., and Nowak, J.: Amenorrhoe in der Kriegs- und Nachkriegszeit, *Zentralbl. f. Gynäk.* 53: 598 (March 9) 1929.

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onset of the condition, so that the physiologic amenorrhea of pregnancy, or fear of it, was ruled out. Also patients with chronic diseases were omitted. It seems clear that emotional shock had much to do with the cause of this widespread amenorrhea, and we thought

TABLE 1.—*Estrogen Determination in the Urine from Two Representative Patients*

Sample No.	Date	Patient 1*		Patient 2	
		Volume In Cc.	Result	Volume In Cc.	Result
1	June 23, 1942	765	Negative	870	Negative
2	June 25, 1942	1,320	Negative	1,320	Negative
3	June 27, 1942	1,020	Negative	1,020	Negative
4	June 29, 1942	1,030	Negative	760	Negative
5	July 1, 1942	1,080	Negative	750	Negative
6	July 3, 1942	1,070	Negative	1,270	Negative
7	July 5, 1942	990	Negative	1,200	Negative
8	July 7, 1942	1,220	Negative	900	Negative
9	July 9, 1942	910	Negative	770	Negative
10	July 11, 1942	1,570	Negative	1,010	Negative
11	July 13, 1942	1,840	Negative	630	Negative
12	July 15, 1942	1,510	Negative	810	Negative
13	July 17, 1942	1,850	Negative	1,580	Negative
14	July 19, 1942	1,160	Negative	1,550	Negative
15	July 21, 1942	1,250	Negative	710	Negative

* Estrogen was demonstrated after return of the menses.

it desirable to study the effect of such shock on the ovarian and anterior pituitary-like gonadotropic excretions in the urine.

MATERIAL

From the 125 women with amenorrhea who were interned in January 1942 2 representative patients were selected, the histories of whom are briefly as follows:

CASE 1.—E. D., a white American secretary, single, aged 26, interned on January 4, was born in Shanghai and had lived in the Orient all her life and in Manila for the past four years. Two years ago a subtotal thyroidectomy was performed, but her menstrual periods were not affected before or after operation. The medical and surgical history was otherwise irrelevant.

TABLE 2.—*Quantitative Gonadotropin Determination of Urine Specimens by the Uterine Weight Method*

Urine of Patient	Dilution	Dose, Cc.	Total Amount Injected, Cc.	Uterine Weight, Mg.	Ovarian Weight, Mg.	Body Weight, Gm.
Patient 1						
Sample 2.....	7×	0.3	1.8	37	17	47
Patient 1						
Sample 8.....	7×	0.3	1.8	16	13	3 weeks old rats
	×	0.3	1.8	11.5	13	
	1/7×	0.3	1.8	15.0	13	
Patient 1						
Pooled specimen...	×	0.3	1.8	11	14	22.5
	7×	0.3	1.8	12	15	27.0
	7×	0.6	3.6	12	0	22.0
	7×	1.0	6.0	18	17	31.0
Patient 2						
Pooled specimen...	×	0.3	1.8	10	8	22.0
	7×	0.3	1.8	12	13	25
	7×	0.6	3.6	13	12	26
	7×	1.0	6.0	27	10	29
Specimen 10 mos. later						
Patient 1.....	7×	0.3	1.8	17	11	28
Patient 2.....	7×	0.3	1.8	6.2	7.1	39

Injectations three times daily for two days.
Animals examined post mortem seventy-two hours after first injection.
7×, original concentration of urine specimen.
×, dilution of concentrated specimen.

She had no loss of weight in camp. Her menses began at 13 years of age, had always been regular with a twenty-nine day interval and four to five day duration until January 10, six days after internment, when she had a ten day menstrual flow followed by amenorrhea of ten months' duration. On physical examination she was tall (5 feet 11 inches, or 180 cm.), slender, with brown hair, and weighed 123 pounds (56 Kg.). The pulse was 80 to the minute and the blood pressure was 120 systolic

and 80 diastolic. The thyroid gland was not palpable and the heart and lungs were normal. The hemoglobin was 75 per cent and the erythrocyte count 4,100,000 per cubic millimeter of blood. On pelvic examination the introitus was virginal and the cervix and uterine body and also the adnexa were found to be normal.

CASE 2.—L. M., a white American housewife aged 28, interned on January 8, was born and has always lived in Manila. A benign breast nodule was removed in 1937 but otherwise the medical and surgical history was not important. She gained 12 pounds (5.4 Kg.) while in camp. Her menses began at 11 years of age and have always been regular, of twenty-eight day interval and four to five days' duration, except during the one and only pregnancy five years ago. Her last period was on Dec. 12, 1941, and except for a one day spotting she has had amenorrhea for twenty months. She had no complaints or other symptoms except the amenorrhea. On physical examination she was medium in height (5 feet 3 inches, or 160 cm.) and weighed 112 pounds (51 Kg.), and no abnormali-

TABLE 3.—*Results of Assay for Gonadotropic Substance in the Urine*

Sample No.	Patient 1		Patient 2	
	Weight of Rat in Gm.	Follicle Stimulation	Weight of Rat in Gm.	Follicle Stimulation
1	39.4		43	
	37	Negative	28.6	Positive
2	58		39.8	
	59	Positive	25.4	Negative
3	42		39.8	
	38	Negative	30.2	Negative
4	47		31	
	47	Negative	30	Positive
5	39.8		27	
	37	Negative	29.8	Negative
6	41.4		29	
	40.4	Positive	29	Positive
7	49		25	
	52	Negative	30	Positive
8	58		27	
	47	Positive	28.8	Negative
9	47		20.4	
	50.4	Positive	31	Positive
10	38.4		25	
	47	Negative	53	Negative
11	39		35	
	39.0	Positive	40	Positive
12	61		55	
	41	Negative	35	Negative
13	39.8		42	
	41	Positive	31	Negative
14	47		37	
	31.6	Positive	35.6	Negative
15	53		32	
	38	Negative	33	Negative

ties of the head and neck, chest or abdomen were found. The blood pressure was 120/80 and the pulse rate was 72 to the minute. The hemoglobin was 80 per cent and the red blood cells were 4,300,000 per cubic millimeter. On pelvic examination the introitus was parous, the cervix slightly irregular, the uterine body normal in size, shape and position and the adnexa were not unusual.

As the extraction of single specimens of the urine may give little information as to ovarian and anterior pituitary function, a longer time was utilized. The full twenty-four hour output except for the first morning specimen was collected and extracted for estrogenic substance every other day from June 23 to July 21, 1942, thus including the time of a complete cycle. The single morning specimens were kept separate and extracted for anterior pituitary-like gonadotropic substance.

METHOD

No attempt is made to review the voluminous literature on the extraction and assay of these hormones. For estrogen extraction a modification of the method of Marrian was used.

The twenty-four hour specimen of urine was measured and acidified to p_H 1.5 with concentrated hydrochloric acid, was boiled for at least an hour and when cool was extracted twice with 500 cc. of benzene. Benzene fractions were combined and extracted twice

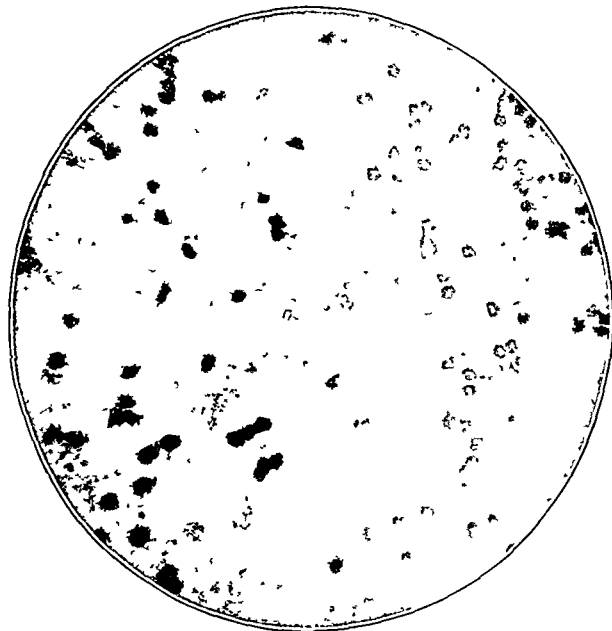


Fig. 1.—Vaginal smear from adult castrate rat showing only leukocytes—no estrogenic response; reduced from a photomicrograph with a magnification of 500 diameters

with 250 cc. of fifth normal sodium hydroxide. The sodium hydroxide fractions were combined and acidified with concentrated hydrochloric acid to p_H 1.5. This was extracted again twice with 500 cc. of benzene. The benzene was then distilled off, leaving 5 to 10 cc. This was transferred to a small flask and evaporated to dryness under partial vacuum. The dry residue was picked up in 10 cc. of ether and 10 cc. of sesame oil, was dissolved by shaking, and the ether driven off in vacuum. The oily extract was then assayed.

Assay: Five-tenths cc. of sesame oil extract was injected subcutaneously in the back of each of 2 adult castrated female albino rats of the Wistar strain in the morning, in the afternoon and in the morning of the day following. (The total injected was 1.5 cc. per rat.) Vaginal smears of rats were made before and twenty-four and thirty-six hours after the last injection.

Extraction of anterior pituitary-like gonadotropic substance: A modification of Zondek's method as mentioned by Kurzrok⁸ was used. The volume of 47 cc. of first morning urine was placed in a 250 cc. centrifuge tube and about 200 cc. of 95 per cent alcohol added and allowed to stand overnight or at least two hours. This was then centrifuged and the supernatant fluid was discarded. Twenty cc. of ether was added to the residue and shaken. This was centrifuged and supernatant fluid discarded. The precipitate was allowed to dry well. Then 7 cc. of distilled water was added and shaken for ten minutes in a mechanical shaker. This was centrifuged again and the supernatant fluid collected and assayed.

Assay: Two immature female albino rats of the Wistar strain were used for each specimen. These

animals were injected subcutaneously twice daily for three days with 0.25 cc. of the specimen (the total amount injected was 1.5 cc.). Autopsy of animals was done on the fifth day and the ovaries were examined microscopically for follicles and corpora lutea.

Several months later a few more rats became available and, as a small amount of material from all specimens remained, it was used according to the uterine weight technic suggested by Delfs⁹ for the assay of serum gonadotropin. Only one rat could be used for each dilution of material. The dose and dilutions are shown in table 2. Subcutaneous injections were given three times daily for two days, and autopsy of the animals was done at the end of seventy-two hours. The uteri were dissected from the peritoneal fold and cut at each end at the junction with the ovary and cervix, and the uteri and ovaries were weighed separately.

RESULTS

During the determination of the presence of estrogen, which was done promptly after the extraction of urine, the test rats reacted to priming doses of a known estrogen, but all the vaginal smears from the same rats injected with the extracts of urine from both patients were completely negative. An example is shown in figure 1. One more extraction and assay was done by the same technic on the urine of patient 1 after the return of her menses. The urine was collected on the approximate day of ovulation. The full estrous response is shown in figure 2, which indicates at least 6.6 rat units in twenty-four hours. No later estrogen determination was done in reference to patient 2, as she had failed to menstruate.

In the determination of gonadotropin, only follicle stimulation, with no luteinization, was observed, as

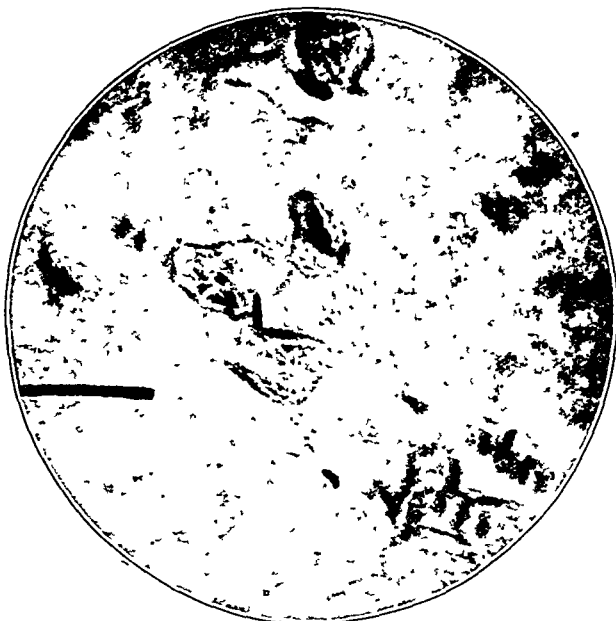


Fig. 2.—Vaginal smear from adult castrate rat showing absence of leukocytes and presence of cornified epithelial cells—full estrous response; reduced from a photomicrograph with a magnification of 450 diameters

is seen after castration or after the menopause. The reaction in the ovary of the test animal from specimen 2 of patient 1 is shown in figure 4, as compared with the control (fig. 3).

⁸ Kurzrok, Raphael. *Endocrines in Obstetrics and Gynecology*, Baltimore, Williams & Wilkins Company, 1937, p. 454

⁹ Delfs, E. An Assay Method for Chorionic Gonadotropin, *Endocrinology* 28: 196 (Feb) 1941.

By the uterine weight method, on another series of rats, this same specimen produced an increase in the weight of the uterus of about 150 per cent as compared to the average weight of the uteri (15 mg.) of 3 control animals. Urine gonadotropin appears to have been increased, as demonstrated by both follicle stimu-

lation and increase in the uterine weights. Another specimen showed little if any effect. The remaining small amounts of all specimens were later pooled and little influence on the increase in uterine weight (table 2) was produced. This pooled specimen was over 1 year old, which may have influenced the result.



Fig. 3.—Ovary from control immature rat with a body weight of 40 grams; reduced from a photomicrograph with a magnification of 70 diameters.

TREATMENT

Functional amenorrhea is a symptom rather than a disease and, if continued for only a few months, probably does no permanent damage. It suggests ovarian hypofunction but, if prolonged, for example for several years, regressive changes in the genital tract might take place. Regular menstruation depends on good health, both mental as well as physical. It is common for women to complain of many discomforts which are relieved by menstruation, but only a few of our patients had symptoms which would mildly suggest a premature menopause. Most of the women in this report overcame the difficulty themselves after a few months. Psychotherapy is within the bounds of good medical practice, and suggestion or assurance that no permanent harm will result may have helped some of these patients.

Active treatment with gonadotropic substance would seem to be contraindicated as, in our material, it is at least present if not slightly increased, although the ovaries do not respond to it. Very few endocrine preparations were available, and most of the small supply of estrogenic substance was reserved for the patients with symptoms of the menopause. We had a small supply of vitamin E in the form of wheat germ oil. Ten patients were given a dose of 20 drops orally three times daily for a period of ten days preceding the expected menstrual flow. Eight of the 10 patients had a menstrual period or uterine bleeding, and 1

COMMENT

Owing to the limitation in the number of rats available, quantitative findings as to gonadotropin in the urine were not very satisfactory, but it was at least demonstrated to be present. If it had been present in excessive amounts, one would assume that permanent ovarian damage was present, which carries a poor prognosis for the patient.

We may have confidence in the finding that estrogen was absent during the amenorrhea and appeared when the menstrual cycle was reestablished, as would be expected.

The ovaries not only are influenced by other endocrine glands but are under the control of the autonomic nervous system. As distinguished from the causes of amenorrhea as reported from central Europe during and after the first world war, malnutrition and other factors were not important in the causation of the war amenorrhea observed in Manila. Although prolonged malnutrition may be considered a cause of amenorrhea, the onset in this group of patients was too sudden, and the food allowance cannot be considered as more than a later contributing factor. In many cases amenorrhea occurred even before internment, as seen in case 2. Very little is known as to the precise role of the special senses in mediating external stimuli in regard to the sex apparatus.¹¹ We believe that severe psychic shock, worry and especially fear caused a suppression of



Fig. 4.—Ovary from immature rat of test series with a body weight of 39 grams, showing follicle stimulation; reduced from a photomicrograph with a magnification of 70 diameters. Urine specimen 2 of patient 1.

ovarian function by way of the autonomic nervous system, thereby removing a possible inhibitory effect of estrogen on the anterior lobe of the pituitary.

10. Mattili, H. A.: Vitamin E, in *The Vitamins*, Chicago, American Medical Association Press, 1939, p. 592.

11. Marshall, quoted by Stone, C. P., in Allen, Edgar; Danforth, C. H., and Doisy, E. A.: *Sex and Internal Secretions*, ed. 2, Baltimore, Williams & Wilkins Company, 1939, p. 1218.

SUMMARY

1. As a result of the war 14.8 per cent of the women in the Santo Tomas Internment Camp at Manila, Philippines, suffered from amenorrhea. Other menstrual disturbances were less frequent.

2. Although nutritional factors may have resulted in amenorrhea developing later, it had little to do with the sudden onset of this widespread condition.

3. In 2 selected patients, estrogen was absent from the urine and anterior pituitary-like gonadotropin was present, probably increased in amount.

4. The war amenorrhea observed in Manila was probably due to severe psychic shock, worry and fear, which, acting through the autonomic nervous system, caused a complete suppression of ovarian function.

5. Reassurance of the patient is a part of treatment. Active treatment, where required in this group of patients, should be by the administration of estrogenic substance rather than gonadotropic material.

In the absence of estrogenic substance, vitamin E in the form of wheat germ oil was used. The good results obtained were probably psychic in nature.

SENSITIVITY TO TOPICAL APPLICATION
OF SULFATHIAZOLE OINTMENT

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The recent widespread use of sulfathiazole ointment has revealed cases of sulfathiazole sensitivity.¹ My aim in this paper is to call attention to the degree of sensitivity to sulfathiazole ointment existing among the general population. The majority of the cases were of a minor surgical nature rather than dermatologic and might therefore show a different amount of sensitivity (probably less) than would a large group of dermatoses.

MATERIAL

Two hundred and eighteen patients were treated topically with 5 per cent sulfathiazole ointment during the period from Jan. 1, 1943 to July 1, 1943. The ointment consisted of anhydrous wool fat 30 per cent, water 25 per cent, white petrolatum 40 per cent and sodium sulfathiazole 5 per cent. No information was found in the literature as to the incidence of sensitivity resulting from hydrous wool fat or petrolatum except that the sulfur dioxide, used to bleach yellow petrolatum white, had occasionally caused some sensitivity reactions. It may be assumed that there has been little sensitivity to hydrous wool fat or petrolatum observed. The cases consisted of 73 lacerated wounds, 16 leg or ankle ulcers, 41 contused and abraded wounds, 38 burns (9 first degree, 22 second degree, 7 third degree), 12 amputations of fingers or toes and 28 miscellaneous infections and other conditions (table 1). The patients were almost entirely male adults; 7.5 per cent were Negroes. The period of treatment varied from one day (in cases transferred to the hospital) to two and a half months, and the number of treatments from one to sixteen.

From the Department of Surgery, U. S. Marine Hospital No. 70, New York. Approved for publication by Thomas Parran, Surgeon General, U. S. P. H. S.

1. Weiner, Alfred L.: Cutaneous Hypersensitivity to Topical Application of Sulfathiazole, J. A. M. A. 121: 411-413 (Feb. 6) 1943.

FINDINGS

Sensitivity to sulfathiazole ointment was found to be present in 12 cases (5.5 per cent). One Negro patient (8.3 per cent) was included in the group of sensitive patients. This patient did not show an acute reaction or an extensive slowly developing sensitivity reaction but a chronic reaction with inhibition of normal healing.

The acute reaction consisted of an erythematous macular or papular and in some cases vesicular or pustular eruption. In the acute cases the reaction was always more generalized than in the chronic cases. Pruritus was always present in the acute cases and frequently in the more chronic cases. Later an eczematous eruption with oozing and crusting often developed. In the chronic cases epidermolysis took place with an exposure of the underlying skin layers. This underlying skin appeared smooth, shiny and red, probably because of the exposure of the rete and subsequent edematous degeneration of the rete cells. The pathologic condition is probably similar to that in eczema and dermatitis venenata,² in which an initial edema of the transitional cell layers and the granular layers of the skin retards granulation and interferes with proper keratinization. The developing exudation continues to cast off the corneous layer. Sensitivity did not appear in less than twelve hours in any case following the topical application of 5 per cent sulfathiazole ointment.

The time of sensitivity as noted in cases showing sensitivity is given in table 2. Patients 1 and 2 showed sensitivity at the time of admission from previously applied sulfathiazole ointment. Patient 2 appeared with an acute generalized erythematous, macular eruption two days after the initial application of sulfathiazole ointment to a small second degree burn of the right forearm. Patient 1, sensitive on admission, presented an oozing, crusted, eczematous reaction from the knee to the ankle of the right leg. It had been

TABLE 1.—Miscellaneous Conditions Treated

1. Miscellaneous infections	
Abscesses.....	2
Furuncle.....	2
Paronychia.....	2
Incised felon.....	2
Infected laceration.....	2
Infected abrasion.....	1
Incised infected sebaceous cyst.....	1
Postoperative bursitis.....	1
Chronic osteomyelitis wound.....	1
2. Frostbite.....	4
3. Avulsion of finger nails.....	4
4. Dog bite.....	3
5. Foreign body puncture wounds.....	3

gradually developing over a five month period during which time 5 per cent sulfathiazole ointment had been applied topically to an abrasion of the leg the site of which was now lost in the generalized eczematous reaction. Sulfathiazole ointment was discontinued. The crusts were completely removed with hydrogen peroxide pledgets. Ammoniated mercury ointment 5 per cent was applied liberally and the leg bandaged loosely. This treatment was given on three visits, and the leg was healed by the ninth day. There was no scarification following healing. This patient and 7 other patients who were tested gave a positive patch test.

Patients 5 and 8 had an exacerbation of the sensitization reaction following the oral administration of

2. Stelwagon, H. W., and Gaskill, H. K.: Diseases of the Skin, Philadelphia, W. B. Saunders Company, 1923, pp. 194 and 283.

1 Gm. of sulfathiazole. The lesions under treatment underwent local exacerbation, while at the same time an erythematous macular eruption appeared on the face, forearms, hands and thorax. Pruritus was prominent in the area of eruption and at the site of local application. Patient 8 was given the drug for treatment of a concomitant gonorrhea.

Four patients showed their sensitivity within six days. The remaining 8 patients were found to have a low grade sensitivity which was noted clinically to have inhibited healing. This low grade sensitivity was probably present sooner, but manifestations were not noted until the time indicated in each case.

REVIEW OF LITERATURE

The use of sulfathiazole ointment topically has been considered to be a relatively innocuous type of treatment. Unfavorable reactions have, however, been reported. Miller³ reports 5 cases (4.3 per cent) of contact dermatitis due to sulfathiazole ointment from a total of 115 cases. The Robinsons⁴ found 2 cases

bury⁸ reported 12 cases in which there was an exacerbation of the sensitization reaction locally from sulfathiazole ointment following the oral administration of sulfathiazole. These cases are similar to the 2 cases (5 and 8) reported in the present study to 2 cases reported by Cohen, Thomas and Kalisch⁵ and to 4 cases reported by Shaffer, Lentz and McGuire.⁶

SUMMARY AND COMMENT

In the present study 5.5 per cent of the patients treated were found to be sensitive to the topical application of sulfathiazole ointment. The permanence of this sensitivity is not yet known. The contact dermatitis in each case disappeared when the sulfathiazole ointment was no longer applied. Clinically it seemed that healing had been definitely slowed.

In a patient who is being treated topically with sulfathiazole ointment it is becoming recognized⁸ (present study) that an acute exacerbation of symptoms locally and generally may follow the oral administration of sulfathiazole. Because this sensitivity may preclude

TABLE 2.—Cases Showing Sensitivity to Topical Application of Sulfathiazole Ointment

Case	Race	Diagnosis	Number of Treatments Before Reaction Noted	Time from Beginning of Treatment to Time Reaction Noted	Patch Test	Time to Heal After Sulfathiazole Discontinued	Comment
1	W	Abrasion and contusion.....	?	5 mos.	Positive	9 days	
2	W	Second degree burn.....	?	2 days	None	Transferred to hospital	
3	W	Abrasion and contusion.....	1	1 day	Positive	10 days	
4	W	Infected laceration.....	2	6 days	Positive	3 days	
5	W	Laceration.....	2	1 days	None	Not healed 1 month and 12 days	Oral sulfathiazole; exacerbation of local symptoms
6	W	Abrasion and contusion.....	2	8 days	Positive	24 days	
7	W	Avulsion of nail.....	3	9 days	None	13 days	
8	W	Partial finger amputation.....	7	23 days	Positive	22 days	Oral sulfathiazole; exacerbation of local symptoms; gonorrhea
9	W	Third degree burns.....	8	24 days	None	46 days	
10	W	Partial finger amputation.....	10	28 days	Positive	47 days	
11	W	Dog bite.....	9	28 days	Positive	21 days	
12	N	Laceration.....	16	49 days	Positive	18 days	

(2.3 per cent) of contact dermatitis among 86 cases in which more than one treatment with 5 per cent sulfathiazole ointment was administered. In the present study 12 cases (5.5 per cent) of 218 were found to show sensitiveness to the topical application of sulfathiazole ointment. This percentage of sensitive patients agrees closely with the amount of sensitivity found by Long and Edwards⁵ in treatment with sulfathiazole given orally. They state that of 271 patients treated 5 per cent developed rashes which progressed to an exfoliative dermatitis on continuation of medication. Klingensmith⁶ has reported a case of severe necrosis of the skin following oral sulfathiazole administration. The description of this case fits the more chronic localized reactions reported in the present paper. Spink and Hansen⁷ reported that the incidence of dermatitis was 9 per cent in a series of 100 patients treated with sulfathiazole orally. Livingood and Pills-

bury⁸ reported 12 cases in which there was an exacerbation of the sensitization reaction locally from sulfathiazole ointment following the oral administration of sulfathiazole. These cases are similar to the 2 cases (5 and 8) reported in the present study to 2 cases reported by Cohen, Thomas and Kalisch⁵ and to 4 cases reported by Shaffer, Lentz and McGuire.⁶

The indiscriminate use of these preparations in minor conditions, when less harmful drugs are adequate, should be discontinued. With the widespread publicity being given to these preparations it would seem desirable to prevent or discourage their sale except by prescription.

8. Livingood, C. S., and Pillsbury, D. M.: Sulfathiazole in Eczematous Pyoderma, *J. A. M. A.* **121**: 406-408 (Feb. 6) 1943. Cohen, M. H.; Thomas, H. B., and Kalisch, A. C.: Hypersensitivity Produced by the Topical Application of Sulfathiazole, *ibid.* **121**: 408-411 (Feb. 6) 1943. Shaffer, Bertram; Lentz, J. W., and McGuire, James A.: Sulfathiazole Eruptions: Sensitivity Induced by Local Therapy and Elicited by Oral Medication, *ibid.* **123**: 17-23 (Sept. 4) 1943.

3. Miller, J. Lowry: Use of Sulfanilamide and Its Derivatives in Ointment Form, *Arch. Dermat. & Syph.* **46**: 379-385 (Sept.) 1942.

4. Robinson, H. M., and Robinson, H. M., Jr.: Local Use of Sulfathiazole in Dermatoses, *South. M. J.* **34**: 1093-1095 (Nov.) 1941. Miller,³ Livingood and Pillsbury.⁸

5. Long, P. H.; Haviland, J. W.; Edwards, Lydia B., and Bliss, Eleanor A.: Toxic Manifestations of Sulfanilamide and Its Derivatives with Reference to Their Importance in Course of Therapy, *J. A. M. A.* **115**: 364-368 (Aug. 3) 1940.

6. Klingensmith, W. R.: Necrosis of the Skin Due to Sulfathiazole, *Texas State J. Med.* **37**: 313-314 (Aug.) 1941.

7. Spink, W. W., and Hansen, A. E.: Sulfathiazole: Clinical Evaluation, *J. A. M. A.* **115**: 840-847 (Sept. 7) 1940.

Pain.—Pain is a definite esthetic experience which appears to be limited to animal life. It is probably one of the earliest of our developed senses and is important as a warning of danger to the organism. The management of pain constitutes a serious clinical problem not only because of itself as a distressing experience but also because continued pain has been demonstrated to have deleterious action on such vital organs as the heart and kidneys.—Hardy, James D.; Wolff, Harold G., and Goodell, Helen: *The Pain Threshold in Man*, Research Publications, Association for Research in Nervous and Mental Disease, Baltimore, Williams & Wilkins Company, 1943.

TREATMENT OF FRESH TRAUMATIC WOUNDS

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The successful treatment of traumatic wounds is probably the most challenging problem in surgery today. Modern life has resulted in an increasing exposure to the hazards of motorized land, air and sea transportation, to those of mechanized industry and to those of modern war. This has produced an enormous increase in the number of extensive and severe wounds.

The treatment of both civil and war wounds is based on the same fundamental surgical principles. In war surgery, however, the execution of the principles is frequently compromised by such factors as stress, time lag, severe shock or lack of materials.

The primary purpose of the treatment of wounded persons is "to save life" by preventing or arresting hemorrhage, by allaying shock and by preventing or controlling infection. The secondary purpose is to save the injured part and restore it as rapidly and as effectively as possible to normal function and appearance. It must be remembered at all times that it is not a wound that is being treated but a patient with a wound.

CONTROL OF HEMORRHAGE

When the wounded patient is first seen by the surgeon, the control of any existing hemorrhage is first accomplished. At this clinic emphasis is placed on the arrest of hemorrhage in most wounds simply by the use of pressure over sterile gauze dressings applied directly to the wound.¹

Elevation of the injured extremity may aid greatly in the arrest of venous bleeding. In the case of active bleeding from a large vessel not controlled by pressure applied through a dressing or directly over the injured vessel, the careful application of a hemostat to the bleeding points is done. We agree with Koch² in that such clamps should remain in the wound and should be incorporated in the dressing until the time of débridement. In our clinic a tourniquet is not used for the emergency control of hemorrhage except in extremities so badly crushed or torn that amputation obviously is necessary. It is then applied as close to the wound as possible and is also useful in stopping absorption of toxic products from the mangled tissues. Furthermore, many patients are seen on their admission to the hospital with improperly applied tourniquets which actually increase the amount of venous bleeding from their wounds. When such tourniquets are released and the part elevated, the bleeding frequently stops at once.

A sterile gauze dressing is applied to the open bleeding wound not only to control bleeding but also to minimize added bacterial contamination, particularly from human sources. The earlier a sterile dressing is applied to the wound, the less chance there is for this type of contamination to occur caused by virulent hemolytic staphylococci, hemolytic streptococci and other bacteria

arising from unmasked upper respiratory tracts of the patient or any one treating or observing the wound, from ungloved hands, from unsterile instruments or linens, or from bacteria laden dust in a busy receiving ward. These sources of additional contamination have been repeatedly stressed by Miles and his associates,³ Hare,⁴ Colebrook,⁵ Fleming⁶ and Koch.² At the Cincinnati General Hospital it has been found⁷ that 35.3 per cent of the wounds are already contaminated by the hemolytic *Staphylococcus aureus* at the time of débridement. This finding indicates the high degree of secondary contamination that may occur in a general hospital practice during the administration of first aid, the transportation of the wounded person to the hospital, and his examination and observation in the receiving ward just prior to operation. It also emphasizes the great importance of having all personnel treating patients with open wounds adequately masked. No attempt of any kind is made in the receiving ward to cleanse or "sterilize" such wounds.

SHOCK THERAPY

During and immediately after the control of hemorrhage, the presence and degree of shock are determined and steps are taken to combat it at once. The patient is placed in "shock position," given morphine by the intramuscular or intravenous route, kept warm with blankets and carefully applied hot water bottles, and given plasma, blood or other fluids as may be indicated in his case. Oxygen therapy is also frequently of value in the treatment of these shocked patients.

After hemorrhage has been arrested, shock therapy started and the wound covered with a thoughtfully applied sterile dressing, the patient is carefully but rapidly examined. Wounded patients frequently have multiple injuries. Some may be obvious, as for example other open wounds, fractures of the extremities or multiple rib fractures with crushed chest. Others may be quite obscure, such as compression fracture of the spine, a traumatic rupture of the spleen, kidney or a hollow viscus in the absence of a penetrating wound, a fractured pelvis or a penetrating wound of the abdomen which first traverses the pleural cavity and diaphragm. Careful examination of wounded extremities is particularly necessary to determine the extent of injury to blood vessels, nerves, bones and tendons, as has been repeatedly emphasized by Koch⁸ and Mason.⁹ Such examinations when skilfully done take only a few minutes.

Additional information is gained from laboratory examinations, including the determination of the white blood cell count, differential count, red blood cell count, hematocrit and hemoglobin levels, and urinalysis. X-ray

3 Miles, A. A., and others. Hospital Infection of War Wounds, *Brit M J* 2: 855 (Dec 21), 895 (Dec 28) 1940.

4 Hare, Ronald. Sources of Hemolytic Streptococcal Infection of Wounds in War and in Civil Life, *Lancet* 1: 109-112 (Jan 20) 1940.

5 Colebrook, Leonard. Sulfanilamide and Wound Infections, *Correspondence, Brit M J* 2: 682 (Nov 16) 1940.

6 Fleming, Alexander. Bacteriological Examination of Wounds, in Bailey, Hamilton. *Surgery of Modern Warfare*, Baltimore, William Wood & Co, 1941, vol 1, chapter 16.

7 Altemeier, W. A. Bacteriology of War Wounds. *Collective Review, Internat Abstr Surg* 75: 518-533, 1942, in Surg, Gynec & Obst, December 1942. Altemeier, W. A., and Gibbs, E. W. The Bacterial Flora of Contaminated Accidental Wounds, to be published.

8 Koch, S. L. Treatment of Open Wounds, *Bull Am Coll Surgeons* 25: 176-178 (June) 1940; Injuries of the Parietes and Extremities.

9 Mason, M. L. The Surgical Principles Involved in the Treatment of Open Injuries, *West J. Surg* 45: 239-248, 19

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1 Reid, M. R., and Carter, B. N. Treatment of Fresh Traumatic Wounds, *Ann Surg* 114: 418 (July) 1941. Stevenson and Reid.¹⁰

2 Koch, S. L. Injuries of the Parietes and Extremities, *Surg, Gynec & Obst.* 76: 1-22 (Jan), 189-196 (Feb) 1943.

examinations are done only when the patient's general condition permits and usually are done on the way to the operating room.

A knowledge of the patient's general condition and the nature and extent of his multiple injuries is of great value in the definitive treatment of the wounds. It may indicate not only the safest type of anesthetic agent and the optimal time for operation but also the most practical and safest operative procedure for each case as compared with the ideal treatment. While the wounded patient is kept in the receiving ward until the operating room is ready and the patient's general condition warrants his transportation there, the institution of early general sulfonamide therapy by the intravenous administration of carefully calculated doses of sodium sulfadiazine may be of prophylactic value.

After removal of the patient to the operating room, shock therapy is continued for seriously injured persons by the intravenous drip administration of plasma, blood or other fluids as indicated, and the definitive wound treatment is begun. This treatment varies somewhat with different types of wounds, but for the purpose of illustration the operative care of a contaminated lacerated wound of less than six hours' duration containing devitalized and traumatized tissues will be given.

OPERATIVE CARE OF A CONTAMINATED WOUND

Such an operation is preferably done under general anesthesia. The operative field is prepared by the operator or his assistant, who scrubs up and puts on sterile gloves. The first aid or emergency sterile dressing is carefully removed, and another dry sterile gauze sponge is placed in the wound without overlapping the edges. The skin is then shaved and any grease, tar or other dirt adherent on the skin is removed with the aid of benzine or ether. The operative field up to the edges of the wound is then scrubbed thoroughly for at least ten minutes with cotton or gauze and plain white soap and water. The hand and foot are carefully cleansed and scrubbed when the wounds are near these structures. The skin is further cleansed with alcohol and ether and then painted with an antiseptic such as tincture of merthiolate, none of the alcohol, ether or antiseptic being permitted to enter the wound. If the wound is located on an extremity we prefer to perform the remainder of the operation under the pneumatic tourniquet applied after preliminary elevation of the extremity for three to five minutes. Gloves are then changed, and the wound is draped with sterile linen. The careful use of a tourniquet maintains a dry field, facilitating dissection, saves blood, reduces the amount of ligature material buried and eliminates frequent sponging of the wound.

At this clinic such wounds are not washed preoperatively and a "dry" débridement is routinely practiced, as previously described by Stevenson and Reid¹⁰ and by Reid and Carter.¹ There is increasing evidence that wet débridement and prolonged washing increase the incidence of local infection.¹¹ An elliptic incision is made through the normal skin about $\frac{1}{8}$ to $\frac{1}{4}$ inch from the wound edges and carried down into the subcu-

taneous tissues. Additional skin is never sacrificed needlessly. The skin flap is then undermined by careful sharp dissection and the incision continued to the underlying muscle fascia. The devitalized fascia and muscle are similarly excised preferably in one piece. In the case of many wounds which are deep and irregular and which directly involve essential structures such as tendons, joints, bone and major blood vessels or nerves that cannot be excised, the ideal excision of all devitalized tissue *en masse* is impossible. However, the excision of all dirty traumatized tissue must nevertheless be complete if serious infection is to be prevented.

Foreign material such as hair, particles of dirt, pieces of clothing or splinters of wood and stone are removed from the recesses of the wound along with the devitalized tissue. All excised tissue and foreign bodies are then placed in appropriate mediums for the isolation and identification of the contaminating bacteria. A small piece of traumatized muscle is always cultured under anaerobic conditions in milk medium for the rapid detection of *Clostridium welchi* (perfringens)¹² within five to ten hours.

After the mechanical cleansing of the wound is completed, the cavity is ready for irrigation. Large quantities of warm saline solution are slowly and gently poured into the wound from a level just above that of the wound. The cleansing is aided by the gentle rubbing of the raw wound surfaces with the gloved finger, which facilitates the floating away of small detached pieces of tissue and clotted blood as advocated by Reid.

During the operation any recognized vessels are clamped and ligated with fine black silk. If the procedure has been done under hemostasis produced by the tourniquet, the tourniquet is then released and any vessels still bleeding after the application of mild pressure by a warm saline sponge are clamped and ligated with fine silk, but no more ligatures are employed than necessary. The wound is again irrigated with warm saline solution and inspected for pieces of ischemic tissue. During the débridement it is obviously essential to preserve the blood supply not only to the wound but to the area distal to it.

At this point all instruments used in the primary phase of the operative procedure and which have been kept carefully isolated are discarded, the operating team puts on new gloves and gowns, and the wound is redraped in preparation for the repair of the injured structures.

PREVENTION OF INFECTION

In the secondary phase of the operative treatment of wounds, every effort is made to restore the injured structures to their normal position, continuity, function and appearance. To achieve this goal it is necessary to prevent the development of infection within the wound.

There is ample evidence that primary deep repair and closure of a wound is a safe and correct surgical procedure in civil practice if the débridement has been adequate, the time interval less than six hours, the blood supply sufficient and the approximation of tissues by sutures is possible without producing tension. In such a wound fine black silk is used throughout for the repair

10. Stevenson, Jean, and Reid, M. R.: Treatment of Traumatic Wounds, *Am. J. Surg.* 40: 442-449 (Dec.) 1939.
11. Meleney, F. L.: The Study of Infection in Contaminated Accidental Wounds, Compound Fractures and Burns, to be published.

12. Altemeier, W. A.: Rapid Identification of *Clostridium Welchii* in Contaminated and Infected Wounds, to be published.

of tendons, nerves, fascia and skin. Only enough suture material is employed to hold in loose approximation live tissue to live tissue. If the closure is done under some tension, counterincisions may be made on either side for relaxation. The importance of avoiding repair by suture under tension is exceeded only by adequate débridement and preservation of local blood supply. If the primary closure is not possible without tension, the wound is either packed open with saline or petrolatum gauze or covered with a graft of intermediate thickness. There are other factors which make primary wound closure impossible, inexpedient or dangerous. Extensive loss of skin and other tissues as the result of injury or necessary débridement may make primary closure impossible. Wounds older than six to eight hours are usually already infected locally and should be left open for adequate postoperative drainage. Grossly contaminated wounds with considerable tissue damage, as for example those produced by land mine explosions or similar accidents, should never be closed regardless of their duration. In fact, if wound débridement is inadequate or compromised for any reason, primary closure is always dangerous.

The treatment described necessarily is varied for different types of wounds. In incised contaminated wounds of less than six to eight hours' duration in which the damage to tissue has been minimal, débridement is not required. After the wound edges and surrounding areas have been cleansed for ten minutes with white soap and water as described previously, the wound is carefully inspected. All foreign bodies, such as glass, are removed and the wound itself is then washed by gently irrigating it with warm isotonic solution of sodium chloride. When the cleansing is completed, the surrounding skin is dried and repainted with tincture of merthiolate solution. Gloves are changed and the wound is redraped. The wound is then repaired as necessary and closed with fine black silk.

The treatment of persons with small puncture wounds or through and through wounds of soft tissues not involving the peritoneal cavity caused by knife, gunshot, ice pick or other similar instruments is quite different. Such wounds warrant local treatment of the puncture wounds only, the remainder of the wound being undisturbed. The wounds and the surrounding skin are cleansed and draped and are then anesthetized with procaine hydrochloride infiltrated well away from the edges. Smooth stab wounds are washed superficially with isotonic solution of sodium chloride and closed by silk sutures without drainage. Gunshot wounds are excised through the skin and fat and washed with isotonic solution of sodium chloride. After cleansing, the wounds either may be left unsutured and covered with petrolatum gauze and a dry dressing or may be closed by black silk sutures through the skin and subcutaneous tissue. It is my opinion that such through and through gunshot wounds should be closed by suture after excision of the wounds of entrance and exit. During the past one and one-half years we have closed this type of wound in civil-practice and have been impressed by the healing by first intention without evidence of infection. If such wounds are left open for the purpose of drainage in the event of infection, such drainage necessarily must be very incomplete and of little practical importance. The development of edema in the

deeper muscles causes herniation of a portion of the muscle through the small hole in the fascia, effectively plugging it. This phenomenon was well known to the French surgeons during the first world war.

After the completion of the operative procedure it is important to dress the wound and extremity with several definite thoughts in mind. In the first place, sterile dressings properly applied greatly decrease the incidence of secondary wound contamination and infection. Secondly, healing is facilitated by the application of moderate and uniformly applied compression over the wounded area. The beneficial effects of compression have been repeatedly stressed by Blair,¹³ Koch, Mason, Reid, Orr¹⁴ and Trueta.¹⁵ Thirdly, immobilization of injured soft parts by means of splints, casts, Schanz dressings or molds is just as important as that of bony parts. The importance of rest in the healing of wounds and in the prevention or treatment of infection cannot be overemphasized.

All wounded patients are given a prophylactic dose of tetanus antitoxin following a negative skin test immediately after operation. In the majority of instances a dose of 1,500 units is given, but in extensive dirty or infected wounds the dose is increased to 3,000 units. The latter dosage is given also to known diabetic patients.

In lacerated wounds containing traumatized muscle, a prophylactic dose of combined tetanus and gas gangrene antitoxin is usually administered. Although polyvalent gas gangrene antitoxin is effective in experimental gas gangrene, we have not been impressed by its prophylactic value clinically. We have learned to depend almost entirely on early and thorough surgical treatment for the prevention of gas gangrene. During the past eighteen months at the Cincinnati General Hospital we have treated 244 soft part and compound fracture wounds. Only 42 received the combined polyvalent antitoxin. The remainder received only tetanus antitoxin, even though the incidence of *Cl. welchi* contamination in these wounds was great. No frank cases of gas gangrene developed, although one small localized gas bacillus infection occurred thirteen days after injury. This responded readily to simple incision and drainage and daily local dressings with zinc peroxide.

It will be noticed that no mention has been made of local wound therapy with the sulfonamides. In an extensive and carefully controlled study of 1,500 wounds conducted under the direction of the subcommittee on Surgical Infections of the National Research Council, the local use of sulfonamides has not decreased the incidence of serious or trivial local infections in soft tissue wounds or compound fractures. We have participated in this study and our results at the Cincinnati General Hospital correspond with the collective report of the Subcommittee on Surgical Infections given by Meleney.¹¹ On the other hand, the general administration of sulfadiazine has apparently been of definite value in the treatment of patients with traumatic wounds. Although the incidence of local infection has not been decreased, the occurrence of spreading infection, of

13. Blair, V. P.: Influence of Mechanical Pressure on Wound Healing, Illinois M. J. 46: 249-252 (Oct.) 1924.

14. Orr, H. W.: Treatment of Infected Wounds Without Sutures, Drainage Tubes, or Antiseptic Dressings, J. Bone & Joint Surg. 10: 605-611 (July) 1928.

15. Trueta, Josép.: Treatment of War Wounds and Fractures, New York, Paul B. Hoeber, Inc., 1940.

septicemia or of death due to infection is extremely low. The evidence is therefore strongly indicative that general sulfadiazine therapy minimizes invasive infection. For this reason it is our practice to administer systemic sulfadiazine therapy at the earliest opportunity and to continue it postoperatively. The dose is adjusted to the weight of the individual patient and a blood level between 6 and 10 mg. per hundred cubic centimeters is maintained for at least ten days. Daily sulfadiazine blood level determinations, red and white blood cell counts and urinalysis are used to control the administration of this drug.

The failure of the sulfonamides to prevent the development of wound infection reemphasizes the surgical truths that the physiologic state of the wound is of the greatest importance in determining the development of infection and that antiseptic or bacteriostatic agents have only transient antibacterial effects and may have definite harmful effects on the wounded tissues. It follows that chemotherapy in any form cannot and will not replace the surgical principles of débridement and asepsis.

To minimize secondary wound contamination and infection, we have adopted most of the steps in the dressing technic recently developed by Miles and his associates.¹⁶ Dressings are done after a period of quiet of one hour or more. This permits most bacteria laden dust particles to settle again to the floor and minimizes air contamination of the wounds. Patients and personnel are masked just before and during the dressings to prevent contamination of the dressing cart and cross contamination of wounds. A two or three individual dressing team is used. In removing dressings it is important to cut the bandage and remove it in one piece. It is then placed at once in a closed metal container. Unwrapping of soiled bandages may charge the surrounding air with bacteria laden lint and dust particles capable of infecting adjacent wounds. The dressing procedure is performed with sterile instruments and dressings, and nothing is touched by the hands until the outer bandage is applied. Cleansing of the hands is done between dressings of contaminated wounds. Various implements used in treatment of open wounds such as arm or foot baths must be carefully sterilized to prevent cross infection of wounds. The use of tub baths is discouraged because of the inevitable contamination of the wound by the bacteria of the intestinal or genital flora.

Postoperatively the wounds are watched carefully for the development of infection, hematoma or other complications, although dressings are not done oftener than necessary. Wounds found to be contaminated by *Cl. welchii* by the rapid method of identification are watched very closely.¹² X-ray films are taken at least twice daily for soft tissue detail to facilitate the earliest possible diagnosis of incipient gas bacillus infection. Other local infections caused by the hemolytic streptococcus and hemolytic staphylococcus are picked up as early as possible to insure prompt treatment. A wound, however, is not dressed until there is a definite indication for doing so, and unnecessary dressings are eliminated as much as possible.

MANAGEMENT OF INJURIES AND INFECTIONS OF THE UPPER EXTREMITIES

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CINCINNATI

The functional value of the human hand must be borne in mind constantly. Most of us show little concern about our upper extremity until we experience injury to or infection in some part of it. Practically every one has as his means of livelihood the ability to work with his hands. Mason¹ has aptly expressed this idea in his statement "Nature has developed in the hand a finely coordinated motor and sensory organ which has made possible our present civilization. The hand is composed of compact and efficiently balanced muscles, tendons and joints, motor and sensory nerves and specialized nerve endings. Bulk and protection are sacrificed to efficiency, there is nothing to spare, each part is reduced to a minimum."

INJURIES OF THE UPPER EXTREMITY

Except in rare instances, infections of the hand and forearm usually follow some injury, and therefore proper treatment of the open wound, whether it is large or small, is of paramount importance. The amount of material equipment needed for proper handling of the wound is small, but the knowledge and experience necessary are great.

The surgeon dealing with an open wound should put on a face mask and also cleanse his hands thoroughly before beginning the systematic examination of an injured extremity. It is important to examine the wound carefully as regards its nature and the extent of the trauma with special reference to damaged tendons, nerves or blood vessels. Only a systematic examination of the various muscles of the forearm in regard to their specific functions will determine the presence or absence of injury to a tendon. Furthermore, a careful examination of the motor and sensory function of the nerves of the forearm must be done. We regularly see patients in whom some major nerve had been severed and was not repaired at the primary operation. These observations suggest that some one neglected to do a careful neurologic examination, or the findings were misinterpreted. It is to be remembered that digital nerves are really important and, if injured, they always require repair. In final analysis the physical findings determine definitely what one may expect to encounter in the definitive treatment of the injury. Such wounds should never be probed, and blood vessels should not be haphazardly clamped and ligated. It is much better to control hemorrhage by pressure dressings during such an emergency than to clamp vital structures in a wound which is oozing and refilling with blood. Hemostatic control of bleeding and ligation of blood vessels should be done during final treatment of the injury.

In our "hand clinic," which is a part of the General Surgical Dispensary, a total of 532 "hand cases" have been observed, studied and followed during the eighteen month period from September 1941 to March 1943.

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1. Mason, Michael L.: Symposium on Surgical Infection: Infections of the Hand, S. Clin. North America 22: 455 (April) 1947

16. McKissock, Wylie; Wright, Joyce, and Miles, A. A.: Reduction of Hospital Infection of Wounds: Controlled Experiment, Brit. M. J. 2: 375-377 (Sept. 13) 1941.

Of this group 306 cases were the result of injury and 226 were due to infection. Table 1 shows the injuries which were treated.

Lacerations.—Simple laceration of some part of the upper extremity, particularly the hand, is the injury most frequently seen. Our general policy in handling such an injury has already been outlined and the method of treating the wound is being discussed elsewhere in this symposium. It is to be remembered, however, that there is no excess tissue in the human hand. Therefore conservation of tissue is a principle which must be followed in the cleansing, débridement and suturing of such an injury.

Many of our cases were treated by the physicians in the admitting ward, some of whom had no previous experience in caring for simple wounds. For this reason infection did occur in many cases. Proper care of simple superficial lacerations of the upper extremity always proves to be worth while.

Tendon Injury.—By this injury is meant those cases which comprise either partial or complete severance of a tendon. Since this type of injury is seen frequently and since the results at best are none too good, only careful surgical repair should be attempted.

Several years ago many severed tendons were repaired in the admitting ward under poor surgical conditions. During the past three years practically all such cases have been repaired in the surgical operating rooms. Tenorrhaphy is almost always done under general anesthesia, silk being used for the suture material. For best results and whenever possible the operation should be done within three hours after the injury is sustained. After an interval of six hours it is questionable whether primary repair should be attempted.

In tenorrhaphy we have followed the technic advocated by Mason and Allen.² The operation is done in a bloodless field, bleeding being controlled by means of a pneumatic blood pressure cuff around the upper arm. The venous blood must be removed from the extremity by elevation of the part for five minutes or more. The pressure within the cuff should be above the systolic blood pressure.

Anatomic replacement of all surrounding tissue should be as complete as possible. We use a sterile aluminum splint to immobilize the forearm and hand in a functional position. Although the wound may be healed and all skin sutures removed, we do not advise motion of the part until fourteen days after the operation. At this time active motion is gradually started. The splint is used to protect the wound and the injured tendons. As more motion is applied the splint soon ceases to be a part of the treatment and is discarded. Squeezing a soft rubber ball in a large arm bath of soapy water stimulates more rapid return of function. Carefully directed physical therapy is helpful. We try to follow all tendon injuries until we are satisfied with the functional result.

Burns.—Burns of the upper extremity are common. Heat burns constitute the large proportion of these cases, although chemical and electrical burns are seen. Heat burns of the hand and forearm, regardless of their severity, respond exceedingly well to "primary cleansing, compression and rest" treatment. Details of this method have been described elsewhere in this symposium. In my opinion burns of the extremities respond better than similar burns elsewhere on the body.

Human Bite.—This injury is seen most frequently in the hand, although it may be seen elsewhere on the extremity. It is usually the result of a fist fight and hence the common site of injury is the dorsum of the metacarpophalangeal joint. At this point the extensor tendon is close to the surface and it is also easy for a tooth to penetrate the joint capsule and carry bacteria into the joint.

Experience leads me to believe that doctors, hospital residents and interns do not have enough respect for this injury. Many patients are examined in the admitting ward, given first aid, discharged and told to return if the wound does not heal. A human bite injury, if not treated properly at the time, will usually lead to serious infection. This is one of the most difficult infections to combat and in most instances leaves some permanent disability.

In the few instances in which we have been able to carry out correct surgical care early, the end results have been good. Only careful cleansing, débridement and repair will prevent serious complications. I believe that human bite injuries more than three hours old should be treated as open wounds. Since infection from human bite injury is frequent, the management of this

TABLE 1.—Injuries of the Upper Extremities

Type	No. of Cases	Per Cent
Lacerations.....	114	37.1
Tendon injuries.....	63	17.3
Burns.....	41	13.4
Human bites.....	31	10.1
Wringer injuries.....	30	9.8
Subungual hematomas.....	13	4.3
Nerve injuries.....	10	3.2
Foreign bodies.....	8	2.6
Dog bite.....	5	1.6
Frost bite.....	1	0.3
Total.....	306	100

complication is important. Splinting of the part is very important. Where cellulitis and edema are the prominent signs, massive warm boric acid dressings should be applied. We have found that the Vapo-therm is very useful to create moist heat in this type of injury. As soon as localization of the infection has occurred, the areas should be adequately opened. In most instances this means that the joint must be drained. The use of zinc peroxide as advocated by Meleney has in some instances helped to control the infection. Diluted solution of sodium hypochlorite is still one of the best agents to combat this mixed type of infection. Osteomyelitis usually develops in cases of pyarthrosis. There is no real indication for amputation of the part. We have had a few such patients develop useful fingers after this type of involvement.

Wringer Injuries.—Wringer injuries are not limited to people working in the laundry. This injury is seen quite frequently in children. Since the rollers of the wringer produce equal pressure on the two sides of the extremity the injury is usually limited to soft tissue and produces contusion and usually bleeding into the tissue spaces. Only rarely are fractures seen with this injury. Occasionally large avulsive lacerations complicate the injury. If there has been no loss of the skin flap, grafting is not necessary. After proper cleansing and débridement of the wound the flap may be replaced and held there by sutures. We have had excellent results

2. Mason, Michael L., and Allen, Harvey S.: The Rate of Healing of Tendons, *Ann. Surg.* 113: 424-463 (Jan.) 1941.

by placing the extremity on a sterile aluminum splint and applying a pressure dressing. Large hematomas of the dorsal subaponeurotic space respond well to this form of therapy. Aspiration is not usually indicated, but, if it is done, care should be used to prevent introduction of bacteria into the hematoma. Large avulsive wounds with loss of skin should be covered by split thickness grafts immediately if the patient's condition permits.

Subungual Hematoma.—This is an injury common to people using their hands, such as mechanics and carpenters. Although small collections of blood under the nail may cause considerable throbbing pain, no treatment need be instituted. Pain can usually be controlled by the ingestion of codeine and acetylsalicylic acid. When a large hematoma develops under the nail it is sometimes imperative to drill a small hole through the nail, cut out a triangular segment of nail, or in some instances remove the nail completely. These procedures should always be done under strict asepsis to prevent contamination of the nail bed.

Nerve Injuries.—Injuries to the radial, median or ulnar nerve trunks are always serious, whether the nerves are partially or completely severed. The first step in treating such an injury is to make the correct diagnosis. Neurorrhaphy performed by an experienced

TABLE 2.—Infections of the Upper Extremity

Type	No. of Cases	Per Cent
subepithelial abscesses.....	131	57.9
Paronychia.....	33	14.6
Felon.....	22	9.7
Subungual abscesses.....	20	8.8
Osteomyelitis.....	13	5.7
Tenosynovitis.....	7	3.0

surgeon yields poor functional results in a great majority of cases. Careful cleansing and débridement of the wound is very important, since infection adds a complication which does not predispose to a good result. The cut ends of the nerve should always be mobilized and debrided when contused or torn. The perineurium should be approximated carefully so as not to suture nerve bundles. There is some disagreement as to whether many small interrupted sutures should be used or whether it is better to use fewer larger sutures. I have followed the principle of using three or four fine silk interrupted sutures and then approximating the perineurium between these with interrupted sutures of "cobweb" silk. Although neuromas have followed such a repair, many cases have progressed to a good functional result. It would seem from the many reports on nerve repair that neuromas will develop in a certain percentage of cases regardless of the method of repair which was used.

The follow-up care after neurorrhaphy is very important. Intelligent splinting of paralyzed muscles has been emphasized by Koch. I believe that proper education of the individual in guidance and therapy over a period of many months is an important principle in rehabilitation of the involved extremity.

Foreign Bodies.—Small splinters usually offer no serious problem. However, steel, glass, needles and bullets are foreign bodies often not easy to remove. Many persons with foreign bodies seek medical attention hours, days and sometimes even weeks after the initial injury. In my experience one should not be

too anxious to retrieve the foreign body too soon after the injury, since the operative procedure might excite infection. Roentgenograms will usually locate the foreign body and fluoroscopy in all planes will more adequately determine its position. We have been prone to remove all foreign bodies in the operating room and under general anesthesia unless contraindicated. Many times it would seem that recovery should be a simple matter and yet after spending several hours of operation the part may be seriously injured and the foreign body still not located.

Dog Bite.—Dog bites of the hand may be of either minor or major consequence. Usually this type of injury is superficial, and unless it is known that the dog is a "stray" there is no great cause for alarm. However, some dog bites are very deep and occasionally do considerable damage to the fingers, the hand and even the forearm. In this type of injury I believe that proper cleansing, débridement and repair is much more satisfactory than other forms of treatment. Tetanus antitoxin should always be given, but rabies treatment should be withheld until the exact status of the animal has been established. If the dog is a pet, then this phase can always be controlled. Injury from a strange dog is somewhat more complicated and perhaps immediate antirabies therapy should be begun.

Frost Bite.—Frost bite of the upper extremities is usually limited to the digits and is not commonly seen. When such patients seek medical attention immediately after the injury, slow elevation of temperature starting with ice cold water is the procedure of choice. The important part of therapy is the prevention of further injury of all physical agents, especially heat, and, secondly, to overcome the stagnation of blood in the peripheral tissues. Elevation of the part with light superficial massage is indicated and this, in addition to properly applied passive vascular exercise treatment, in the early phase of this disturbance of circulation, will materially aid in preventing serious sequelae by overcoming the venous stagnation.

When patients seek medical attention late, little can be done except to keep them comfortable and keep the traumatized areas clean. If local necrosis of tissue occurs it is wise to allow complete demarcation of the injured tissue before any amputation should be considered.

INFECTION OF THE UPPER EXTREMITY

It has already been pointed out that most infections seen in the upper extremity follow injuries. Only in rare instances are infections endogenous. Again I must repeat that the majority of infections of the hand might well have been prevented or the severity greatly reduced by early and proper treatment of the initial wounds.

When infection does occur it usually manifests itself as a specific type of infection and must be treated accordingly. In our clinic 226 cases of infections of the upper extremity were treated and studied from September 1941 to March 1943. Table 2 shows the common infections which were treated.

SUBEPITHELIAL ABSCESES

The importance of intracutaneous and subcutaneous infections of the upper extremity lies in their frequency and the danger of being transformed into more serious complicating infections.

Intracutaneous infection is a lesion which we have noted frequently. A history of infection following a blister or a small abrasion with a rather rapid spread

in the skin itself is usually obtained. Occasionally the entire circumference of the finger is involved. The surface epithelium appears as a blister and, on opening this, one sees that the content is a thin watery discharge in which are scattered flakes of necrotic tissue. The basic epithelium appears red and edematous. This lesion is usually caused by the hemolytic *Staphylococcus aureus*. The treatment of the lesion confines itself essentially to removal of the entire blister and immediate application of sodium hypochlorite solution. We have tried moist and dry dressings, as well as other substances, with the invariable result that on subsequent dressings the infection has spread beyond the limits previously seen. If this infection is not brought under control it may give rise to deeper, more complicated infection.

Subcutaneous abscesses usually start from small wounds or pin pricks and may be caused by a multiplicity of organisms. This type of infection usually becomes well localized but may be associated with a certain degree of cellulitis. When the lesion occurs on a finger it may require careful observation and judgment to differentiate it from tenosynovitis, the most feared of all infections of the hand. Occasionally it may completely encircle the digits, in which case a differential diagnosis may be impossible. The treatment is based on an early accurate diagnosis and, when localized, early adequate drainage must be instituted. Occasionally this type of infection is seen about the distal phalanx and is confused with a paronychia.

Paronychia.—This lesion is frequently seen among doctors and nurses as well as hospital attendants. The infection usually begins in the marginal sulcus and as it progresses the edema on the marginal wall becomes apparent. This explains the common name of "run-around." This lesion is usually very painful and particularly uncomfortable at night because of the throbbing pain. The diagnosis is not difficult, and pressure on the nail usually elicits definite tenderness. I have found this point of examination very helpful in differentiating it from a subepithelial abscess in close proximity. Partial removal of the nail with oblique incisions from the base on either side or complete removal of the nail are the procedures of choice. We have used the one of complete removal of the nail because the type patient seen in our clinic many times is not too cooperative in returning for subsequent examination. When the nail is completely removed, no incisions are made. The nail bed is covered with petrolatum gauze and the dressing is not changed for three to four days. With the finger splinted, the infection is allowed to drain freely and rapid healing of the nail bed occurs. Complete nail regeneration usually occurs between two and three months after removal.

Felon.—This lesion is an infection in the distal phalanx, in which case the anatomic peculiarities explain the symptoms and course of the process. The connective tissue septums connect the volar surface of the skin of the tip of the finger to the bone. They hold the infection localized and, since extension is impossible, high pressure develops in this area. The distal phalanx becomes diffusely tense, and throbbing pain starts early in the course of the disease. The edema leads to impairment of the blood supply and, unless treatment is instituted early, necrosis of the distal end of the phalanx is to be expected. Osteomyelitis of the bone is not uncommon. As soon as the diagnosis of a felon is made, incision and drainage should be instituted.

This should be done under general anesthesia. A lateral incision extending from the junction of the proximal and middle thirds of the distal phalanx to the tip of the finger and sweeping entirely across the pulp space to the skin of the opposite side is the procedure of choice. This cuts all the septums midway between the bone and the volar skin. Through and through and fishmouth incisions should be discouraged, since the former lead to unnecessary necrosis of tissue and the latter may yield a painful scar.

Subungual Abscesses.—A subungual abscess most frequently results from a foreign body under the nail. Careful histories reveal that the majority of patients attempted removal of it. I believe that infection starts primarily from this source and not from the injury created by the foreign body. In small subungual abscesses a V segment of the nail over the infection will usually promote adequate drainage. However, in large abscesses I believe it much wiser to remove the nail because necrosis of the nail bed may lead to osteomyelitis of the distal phalanx. This has happened in a small number of cases. Immediate treatment of the abscess with a solution of sodium hypochlorite will usually control the infection much more rapidly than any other substance.

Osteomyelitis.—This may occur in any part of the upper extremity. As a rule this type of infection is of exogenous origin when it involves the phalangeal and metacarpal bones, whereas in the other bones of the extremity it is usually of endogenous origin. In this discussion we are concerned with those cases of osteomyelitis which are complications of infections of the hand. This infection is frequently seen as a complication of human bite infection when there is an associated pyarthrosis. It may also be a complication of acute suppurative tenosynovitis. In many instances it is extremely difficult to diagnose and on final analysis is proved only by the presence of bone involvement as shown on the roentgenogram. We have utilized all the principles in the management of this infection as are applied to soft tissue lesions. As a complication with other infections the area should have adequate drainage and rest along with sterilization of the infected area. One must expect this lesion to persist for weeks. However, with proper care it should progress to healing. Too many surgeons amputate digits unnecessarily as soon as the bone shows involvement.

Tenosynovitis.—This is one of the most feared of all inflammatory processes. The function of the hand disappears rapidly with this lesion. It is fortunate, as shown in table 2, that the frequency of this type of infection in the hand is much less than others.

Usually acute suppurative tenosynovitis is the result of direct injury to the tendon sheath such as a cut or the injection of a piece of steel or wood followed by infection. The four cardinal signs of this infection are (1) diffuse swelling of the finger, (2) tenderness over the anatomic distribution of the tendon sheaths, (3) the finger held in slight flexion and (4) exquisite tenderness on attempting to move the fingers either actively or passively. In this instance one is dealing with pus in an enclosed space and, unless early surgical intervention promotes adequate drainage, the pressure built up within the sheath will cause spread of the infection.

Operation should always be done under general anesthesia, and adequate knowledge of the anatomy of the parts involved is essential to the surgeon. The finger should be opened on the lateral aspect in a bloodless

field, care being used never to cut the digital vessels or nerves or the transverse pulleys of the fingers. With this technic the tendon sheath is opened not only in the finger but also through a small transverse incision in the palm of the hand. If early drainage has been adequate and if tendon necrosis has not already started, many cases will respond well to therapy.

Complications from this infection may be fascial space abscesses of the hand, radial and ulnar bursitis, and a retroflexure space abscess. When these spaces become infected, adequate incision and drainage are again the only treatment of choice.

In this type of serious infection with or without many of its complications the patient needs adequate general therapeutic measures. These are bed rest, adequate oral or parenteral fluid intake, rest of the involved part, intelligent application of warm moist saline or boric acid dressings, utilization of small whole blood transfusions and, unless contraindicated, the systemic administration of sulfonamide drugs. With these principles in mind, better results will be obtained.

COMMENT

Injury practically always precedes infection, and therefore proper treatment of the initial injury constitutes good prophylactic surgery. If this principle were constantly kept in mind, less serious infections of the upper extremity would result and disability of working people would be shortened. As has been pointed out elsewhere,³ it must be remembered that a good functional result should be the ideal goal and not just a nicely healed wound. This is the primary function of the Hand Clinic at the Cincinnati General Hospital.

MANAGEMENT OF COMPOUND FRACTURES

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When a patient receives a compound fracture the wound should be covered with sterile gauze and the limb should be splinted in order that movement made necessary by transportation will not disseminate or more deeply implant contaminating organisms. The classic description of the handling of his own case by Percival Pott is hard to improve on either as to method or as to excellence of descriptive English.

Before any local treatment of the wound is started, the patient should be thoroughly examined for evidence of severe shock or loss of blood. He should also receive a thorough physical survey for other injuries which are less evident than the compound fracture. Embarrassing experiences may occur from overlooking fractures of the clavicle, pelvis, cervical or lumbar vertebrae or ribs, and a condition which was interpreted as shock from the compound fracture may be due to a ruptured viscus, retroperitoneal or intraperitoneal hemorrhage or a contused or lacerated kidney. When it is certain that a patient is in shock, appropriate treatment should be instituted. Transfusions of whole blood meet most completely the requirements for loss of blood or shock. When a blood bank with whole blood is not available and a suitable donor is not at hand, the best substitute

is plasma. Two to 4 pints may be given, and as soon as the patient reacts sufficiently to begin the treatment of the injury continuous slow intravenous infusion may be maintained.

The first treatment should have for its main purposes decontamination of the wound and arrest of hemorrhage. When the fracture has been compounded from within or by a gunshot wound it has become our custom to do no more than excise the skin margins, apply sterile dressings and reduce the fracture or immobilize it in the best obtainable position. Excessive bleeding or evidence of gross contamination are two complications which cause us to explore the wound and the site of the fracture more completely.

When the wound is large, is obviously contaminated and is bleeding freely or the fragments are extensively comminuted, exploration is required and this takes the form of complete débridement. It should not be necessary to emphasize that this is a formidable procedure and to be effective must be carefully and thoroughly done with the greatest care to stop all bleeding and handle all tissues with gentleness.

It is our custom to set up two instrument tables. The wound is packed with gauze and the skin is scrubbed with soap and water, shaved and then washed with alcohol and ether. The margins of the wound are then excised about the gauze packing, and the excision is carried deeper through any superficial devitalized or contaminated tissue. The entire excised mass of skin, subcutaneous tissue and gauze packing is then removed in a single mass, after which the wound is generously but gently flushed with salt solution. The first instrument table is then set aside, gloves and gowns are changed, the field is redraped and sterile towels are clipped to the wound margins. The wound is then thoroughly and systematically inspected and all tissue which shows evidence of soiling, severe bruising, infiltration with blood and any muscle which does not retract on cutting or pinching is excised. During this examination and excision, irrigation is repeated frequently; but scrubbing is very gently done and only with the gloved fingers. No scrubbing is done with gauze. Finally any soiled bone is removed with a sharp rongeur, and completely detached small fragments are removed. After final irrigation and complete hemostasis the wound may be closed or left open.

The ideal reduction and fixation can be obtained when the break is nearly transverse and the surfaces formed by the fracture are serrated to such a degree that they will engage and dovetail and remain in position without any need for foreign material to hold them in place. When this fortunate combination of conditions is present, the wound may be closed and the limb encased in plaster in a position of rest. Care must be observed to immobilize the adjacent joints in sufficient flexion to prevent the fragments from being displaced by rotation. Any movement of the fragments in tissue which still harbors bacteria may traumatize the tissue sufficiently to activate subsiding bacterial proliferation. On this account some form of rigid immobilization is desirable when they cannot be made to engage. One is by bolting, screwing or plating the fragments to one another so that all movement is stopped. The second method is by inserting multiple pins into the fragments above and below the fracture and clamping the protruding portion of these pins to a splint whose bars

3. Siler, Vinton E.: The Management of Acute Infections of the Hand, Ohio State M. J. 38: 922-924 (Oct.) 1942.
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parallel the bone. Later the limb may be encased in plaster in which the pins are embedded and in this manner the bone is rigidly fixed to the plaster case.

The first method is objectionable because it is well known that a foreign body is not well tolerated when buried in contaminated or infected tissue. Much of this objection has been overcome by the use of metal fixation which is both chemically and electrolytically inert; also the local and parenteral use of the sulfonamides has had a beneficial effect in inhibiting bacterial growth, even when a foreign body is present. However, one should hesitate to embed a foreign body in a fracture when in doubt about the thoroughness and effectiveness of the débridement, when the débridement has been delayed, and when soiling and comminution are extensive. It is our custom to give a sulfonamide compound parenterally as soon as possible. We have not been convinced that local scattering through the wound of a sulfonamide is useful and believe that it may possibly be harmful by causing irritation and so reducing tissue resistance. Consequently we are awaiting the experience of others before adopting this possible further tissue insult.

If the fragments are to be held by multiple pins, these may be inserted and clamped before closing, or the pins may be inserted, the wound closed and the fragments then reduced and the pins clamped under fluoroscopic control. The first plan requires two crews and is troublesome, while the second generally necessitates the removal of an anesthetized patient to a fluoroscopic table and often leads to considerable disarrangement of the fragments.

After débridement of a compound fracture the preference is for closure of the wound. When this is done it should always be done loosely and never by layers. When closure without tension is not possible, relaxing incisions may be made at a distance in order to close the original wound, and the granulating areas left from these incisions are later covered with skin grafts. For immobilization we prefer plaster, applied without padding. Open wounds which cannot be closed are loosely packed with petrolatum gauze. When a compound fracture has had a complete débridement and has subsequently been encased in an unpadded cast, the cast is always split and the limb is inspected by x-rays for gas at least twice daily for the first two or three days.

All our patients with compound fractures receive combined tetanus and perfringens antitoxin on admission. They are given 3 Gm. of sulfadiazine at once and 1 Gm. every four hours afterward until a determination of the level shows 6 mg. per hundred cubic centimeters. A discovery of a predominance of streptococci in the wound should be followed by a change to sulfanilamide in which a level of 10 mg. per hundred cubic centimeters is the maximum level desired.

These methods have been followed with only slight personal variations for the past six years. Since the standardization of our débridement and insistence on details which we have come to believe as essential, we have had surprisingly few infections in compound fractures. On the other hand we have had good union and excellent functional results in many severe injuries which were badly contaminated.

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BACTERIOLOGY OF TRAUMATIC WOUNDS

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Recent wars have crystallized interest in the bacteriology of traumatic wounds. The literature which accumulated from the first world war alone was enormous. Because of the limited methods of cultivation and identification of bacteria in use then, many of these studies were not entirely satisfactory. However, they showed the frequency with which the anaerobic bacteria of gas gangrene could be cultivated from war wounds. As a result of the intensive study of Fleming, Wright, Henry, Weinberg and Sequin, and others, several fundamental concepts were developed. Wounds received in combat usually were grossly contaminated and all became infected if untreated. The organisms found in wounds were roughly divided into three groups: (1) sporulating microbes of fecal origin, (2) nonsporulating microbes of fecal origin and (3) pyogenic cocci. The first group consisted chiefly of gas producing bacteria, such as *Clostridium welchi* (perfringens), *Clostridium oedematis maligni*, *Clostridium histolyticus*, *Clostridium sporogenes*, *Clostridium fallax*, *Clostridium tertius*, *Clostridium septicum* and *Clostridium tetani*. Non-sporulating bacteria of fecal origin included the enterococci and bacteria of the colon-typhoid group. The third group of pyogenic cocci consisted chiefly of the staphylococcus and streptococcus. Nearly all war wounds contained these pyogenic cocci sooner or later.

Three phases in the bacterial flora of wounds were recognized by Fleming.¹ The primary stage of infection lasted approximately one week and was characterized by a dark reddish brown, foul smelling, watery discharge consisting of blood more or less altered by the growth of fecal bacteria. The sporulating anaerobes and streptococci were most commonly seen in this stage. The secondary phase showed a gradual transition between the primary anaerobic infection and infection with pyogenic cocci. During this transition the exudate became purulent and progressively less in amount. This stage lasted from two to three weeks and was followed by the tertiary phase characterized by the gradual disappearance of the fecal elements of the bacterial flora and by the persistence of simple pyogenic infection produced by staphylococci or streptococci.

Fleming also demonstrated that *Cl. welchi* was present in 81 per cent of the war wounds of from one to nine days' duration, in 34 per cent of the war wounds of from eight to twenty days, and in only 18 per cent of the wounds more than twenty days old. Staphylococci were found in practically all severe wounds in some stage of infection. *Pseudomonas aeruginosa* (*Bacillus pyocyaneus*), *Proteus vulgaris* and coliform bacilli may be found frequently in all stages of infection, but their pathogenicity is low although they have considerable nuisance value. Diphtheroid bacilli were present during the later stages but were seldom of importance. In addition the bacterial flora was found to be mixed, consisting of two or more bacteria in any of the stages.

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1. Fleming, Alexander: On the Bacteriology of Septic Wounds, *Lancet* 2: 638-643 (Sept. 18) 1915.

WOUND CONTAMINATION

Bacteria may be deposited in a fresh accidental wound at the time of its infliction and at any time afterward. After micro-organisms are carried into open wounds, a variable period of contamination exists during which the bacteria multiply in the devitalized and injured tissues, but the absorption of toxins is minimal and the invasion of the lymphatics surrounding the wound has not yet occurred. The interval of time that separates a contaminated from an infected wound represents the period of incubation for the bacteria present in the wound. Although the time varies with the virulence and rate of growth of the micro-organisms, it usually lasts from six to eight hours with an outside limit of twelve hours. Its duration is also dependent on other factors such as the location and nature of the wound, the general condition of the patient and the presence of systemic diseases, particularly diabetes. During the period of contamination, relatively few bacteria will be seen in a stained smear of the secretions from the wound.

Considerable difference in opinion has existed regarding the question of whether or not all traumatic wounds are contaminated by bacteria. Many reports indicate that negative cultures may be found in from 7 to 41 per cent of fresh accidental wounds, but an analysis of these studies shows that in the majority of instances the specimens cultured were obtained from swabs and not from debrided tissue. On the other hand, the reports of Sās,² of Pulaski, Meleney and Spaeth³ and the report I⁴ made indicate that all traumatic wounds are contaminated by bacteria.

During the period of contamination the more common types of organisms found in traumatic wounds include:

1. Staphylococci: hemolytic and nonhemolytic.
2. Streptococci: hemolytic, nonhemolytic, green producing, microaerophilic and anaerobic.
3. Enterobacilli: *Escherichia coli*, *Proteus vulgaris*, *Eberthella*, *Shigella*, *B. alkaligenes*, *Pseudomonas aeruginosa*, *B. prodigiosus* and others.
4. Clostridial bacteria: *Clostridium perfringens*, *novyi*, *tetani*, *sporogenes*, *septicum* and others.

If a traumatic wound has not received treatment for eight or more hours after its inception, particularly if it is grossly soiled, it may be considered infected. As infection succeeds contamination, bacteria extend beyond the wound edges, invasion of the lymphatics occurs, toxins are absorbed and the patient becomes ill.

The most serious infections occurring in traumatic wounds are tetanus, gas gangrene and pyogenic infections. Other less common lesions complicating wounds listed by Cruikshank⁵ are wound diphtheria, "Meleney's" ulcerations and infections caused by anaerobic streptococci and anaerobic gram negative bacilli. Infections with anaerobes show a high mortality rate but a shorter period of danger of life, unless the anaerobes are in association with a hemolytic streptococcus. Clostridial bacteria play the most important part in primary infection of war and extensive civil wounds. In general their pathogenicity is low unless they are placed in a wound containing devitalized tissue. Gas

gangrene and tetanus are prone to occur during this stage. The primary infection disappears at variable rates in different wounds, depending on the severity of the wound and presence of sloughs; sequestrums or foreign bodies. It is gradually replaced, often during the second week, by the stage of secondary infection caused chiefly by the pyogenic cocci, especially the hemolytic *Staphylococcus aureus* and *Streptococcus hemolyticus* and to a lesser extent by *P. aeruginosa*, *E. coli* and *Proteus vulgaris*.

SOURCES OF BACTERIA

Primary Infection.—The most important sources of the bacteria producing primary contamination and infection are soil, clothing, skin, hair and various other foreign bodies including wood, metal or stone splinters. The great number and variety of bacteria of fecal origin in soil, especially when it has been highly fertilized and cultivated, is well known. Zeissler⁶ has pointed out that the incidence of the various causal organisms of gas gangrene in the soils of different battlefields is established. Wan⁷ has estimated that the number of *Cl. perfringens* spores in cultivated and polluted soils may reach 10,000 per gram of soil. We have examined dirt from many of our major street intersections in Cincinnati and found spores of *Cl. perfringens* almost invariably present.

Until recently it was thought that the presence of gas gangrene bacteria on the clothing and skin of a civilian or soldier was dependent on contamination by soil or feces. Gage⁸ and Maes⁹ have pointed out an additional explanation for bacterial contamination of wounds by clothing. All domestic animals, especially sheep, harbor anaerobic micro-organisms, and clothing made from wool is naturally contaminated by *Cl. perfringens* and other anaerobic gas producing bacteria. In 25 pieces of woolen cloth cultured recently I⁴ found *Cl. perfringens* in 23.

Bacteria resident on the patient's skin or hair may be carried into the deeper recesses of a wound. The integument normally has a resident bacterial flora composed usually of staphylococci but occasionally of streptococci, coliform bacteria and sporulating anaerobic bacteria. It has been pointed out by Hirshfeld¹⁰ that the gentle agitation of eyebrows over an open Petri dish of blood agar will result in the growth of from 2 to 100 colonies of staphylococci. Price¹¹ has shown that when the skin is constantly exposed to certain bacteria they may become part of the resident flora. Gillespie, Devinish and Cowan¹² found virulent strains of staphylococci in the cutaneous bacterial flora of 19.5 per cent of 159 medical students.

Secondary Infection.—The sources of the very important secondary contamination and infection of wounds include the (1) respiratory tract of the patient or any one treating or observing the wound, (2)

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5. Cruikshank, Robert: Bacteriology of Infected Wounds, *Lancet* **1**: 704-706 (April 13), 750-752 (April 20) 1940.

unsterile dressings, (3) the skin of any one touching the wound, (4) dust of the operating room or hospital ward and (5) contaminated dressings, instruments or utensils. The discharge from infected wounds such as burns, open draining wounds or fecal fistulas may contaminate the dressings, clothing and bedding, and manipulations of these may charge the air with bacteria laden particles of lint, dust, epithelium or dried exudate. Exposed wounds thus become repeatedly inoculated with these bacteria. Another method of cross infection of wounds within hospitals is found in the bathing of wounds in tubs, arm baths or foot baths that have been either inadequately sterilized or not sterilized at all.

Hare¹³ and Fleming¹⁴ believe that the hemolytic streptococcus is the most important agent in secondary infection, although it has been our experience at the Cincinnati General Hospital that the hemolytic *Staphylococcus aureus* is more important. Contamination of fresh accidental wounds with the hemolytic *Staphylococcus aureus* had already occurred in 35 per cent of the cases by the time débridement was done. This bacterium was introduced into the wound possibly at the time of injury but more probably at some later time during the administration of first aid, the transportation of the patient to the hospital or his examination or observation in the receiving ward prior to operation. In a few instances these organisms may come from the patient's own skin, but usually they are introduced into the wound by faulty technic of dressing, droplet contamination from an infected or carrier attendant or from infectious dust or bed clothing. It is interesting to recall that Lord Lister laid great stress on air borne infections, but until very recently their importance has been underestimated. It must be remembered that the hemolytic streptococcus can remain viable for a considerable length of time in dust, and that when blankets and bedding are shaken or the floor is swept these bacteria go into the air and become a potential source of infection. Unless very strict precautions are taken, secondary or cross infections are bound to occur in a surgical ward.

In previous wars as well as in time of peace, the spread of *P. aeruginosa* through a crowded hospital surgical ward was well known and was easily recognized by the green or greenish blue discoloration of the dressings. This phenomenon is of great importance since it is a visible indication of flaws in surgical technic and it would be probably easier to establish growth of a greater pathogen than *P. aeruginosa* such as the hemolytic streptococcus or the hemolytic staphylococcus.

Although it was known in the first world war that the incidence of hemolytic streptococcus infection of wounds increased with the age of the wound, the work of Miles and others,¹⁵ of Hare and Willits¹⁶ and of Fleming¹⁴ has clearly explained the mechanism and extent of secondary contamination. According to a recent *Lancet* editorial¹⁷ secondary infection occurred in only 5 per cent of the open wounds on admission to the hospital, in 50 per cent after one week's hospitalization and in from 70 to 80 per cent later on.

The hemolytic streptococci have been grouped serologically by Lancefield¹⁸ and approximately 90 per cent of the pathogenic strains occur in group A. It is also possible to group the great majority of pathogenic hemolytic staphylococci by their ability to coagulate human plasma by means of the coagulase test.

To overcome the dangers and results of secondary contamination and infection, McKissock, Wright and Miles¹⁹ developed a new dressing technic designed to prevent the mechanical transfer of infected material from one wound to another and the contamination of wounds by droplet or air dust. With this method of dressing wounds they reduced secondary infection of war wounds from 31.3 per cent to 2.2 per cent. The application of various oily substances to blankets, sheets and floors has been recommended to reduce the production of dust. The early application of a sterile dressing to a wound as a first aid measure is advised, but touching the wound with unsterile dressings, fingers or other soiled objects is distinctly discouraged.

Factors Influencing Wound Infection.—The factors which determine the development and character of infection include (1) the virulence, types and number of contaminating bacteria, (2) the nature, location and duration of the wound, (3) the presence of foreign bodies, (4) the general condition of the patient, (5) the immunity response of the individual and (6) the type and thoroughness of treatment.

The presence of virulent strains of such bacteria as *Cl. perfringens*, *Cl. septicum*, *Cl. oedematis maligni*, *Cl. histolyticus*, *Cl. tetani*, hemolytic streptococci and hemolytic staphylococci in a wound furnishes the agents of infection. It must be remembered, however, that the mere presence of virulent bacteria in a wound does not make infection of that wound a certainty. *Cl. perfringens* has been found consistently in one third of our major wounds in the Cincinnati General Hospital²⁰ at the time of débridement, yet the development of gas gangrene in such cases is extremely infrequent. The evidence indicates that the physiologic state of the tissues within the wound before and after treatment is more important than the presence of bacteria per se, although the degree of soiling, the amount of tissue damage and the number of contaminating bacteria have long been known to increase the probability and severity of wound infection. The synergistic or cumulative action of the bacteria present may also determine to a large extent the nature and severity of the infection.

We agree with Bisgard and Baker²¹ that no method of treatment in use today renders a contaminated wound absolutely free from bacteria. Under such conditions the development of infection would be dependent largely on the number and virulence of the organisms remaining in the tissues and the amounts of devitalized tissue or other foreign bodies available for bacterial nutrient mediums. The enhancement of infection by the presence of a bullet retained in a wound of the soft parts or even a compound fracture does not mean that this foreign body will always cause infection, since it is every one's experience in civil practice that such wounds may heal promptly and without evidence of infection. It must be

13. Hare, Ronald: Sources of Hemolytic Streptococcal Infection of Wounds in War and in Civil Life, *Lancet* 1: 109-112 (Jan. 20) 1940.

14. Fleming, Alexander: Bacteriological Examination of Wounds, in Bailey, H.: *Surgery of Modern Warfare*, Baltimore, William Wood & Company, 1941, vol. 1, chap. 16.

15. Miles, A. A., and others: Hospital Infection of War Wounds, *Brit. M. J.* 2: 855 (Dec. 21); 895 (Dec. 28) 1940.

16. Hare, Ronald, and Willits, R. E.: Bacteriology of Recently Infected Wounds with Special Reference to Hemolytic Streptococci and Staphylococci, *Canad. M. A. J.* 46: 23-30 (Jan.) 1942.

17. The Ward Dressing, editorial, *Lancet* 2: 565 (Nov. 8) 1941.

18. Lancefield, R. C., and Hare, Ronald: Serological Differentiation of Pathogenic Strains of Hemolytic Streptococci from Parturient Women, *J. Exper. Med.* 61: 335-349 (March) 1935.

19. McKissock, Wylie; Wright, Joyce, and Miles, A. A.: Reduction of Hospital Infection of Wounds: Controlled Experiment, *Brit. M. J.* 2: 375-377 (Sept. 13) 1941.

20. Altmeier, W. A.: The Incidence of *Clostridium Welchii* in Fresh Traumatic Wounds, *Tr. West. S. A. (1941)* 51: 110-125, 1942.

21. Bisgard, J. D., and Baker, C. P.: Treatment of Fresh Traumatic and Contaminated Surgical Wounds, *Am. J. Surg.* 55: 386-396 (Feb.) 1942.

remembered that suture material buried within a wound may act as a foreign body and must therefore be used intelligently, just enough being employed to approximate live tissues and obliterate "dead pocket" as much as possible. In the case of contaminated abdominal wounds we believe that the foreign body effect of buried suture material can be completely eliminated by the through and through silver wire closure as described by Reid and Zininger.²²

The type of wound is a very important determining factor in infection. Extensive wounds containing large amounts of devitalized tissues, especially muscle, fascia and bone, furnish excellent culture mediums in which contaminating bacteria may develop and infect the wound. Wounds of the thigh or buttocks may severely damage a pound or more of muscle, and these greatly devitalized masses may show the phenomenon of gas gangrene in its most obvious form. On the other hand, through and through bullet wounds not perforating the lumen of organs containing bacteria such as those of the respiratory or gastrointestinal tract rarely become infected and usually heal spontaneously. During the past two years it has been our policy to excise the point of entrance and exit of such wounds and close them by suture. Almost without exception, prompt healing without infection occurred.

The multiplicity of severe wounds in one person may so compromise the treatment that adequate débridement of one or more of the wounds is not possible. Because of associated severe shock, hemorrhage, head wound or chest injury, the local treatment of wounds necessarily assumes a minor role to the general treatment of the patient. If the period of time required for the successful general treatment exceeds six to eight hours, infection will have occurred before local definitive treatment can be started.

"Time lag," the period between infliction of the wound and surgical therapy, is usually less than six hours in civil practice. It is imperative that adequate débridement be done during the first six to eight hours, the so-called golden period, if infection is to be prevented. When the "time lag" exceeds six to eight hours and certainly twelve hours, infection automatically succeeds contamination and thorough débridement is no longer possible.

Impairment of the local blood supply by damage or ligation of large vessels, by displaced fractures, by pressure of hematomas, by tourniquets or ill applied and fitting casts or by increased subfascial tension due to edema, hemorrhage or sutures favors the development of infection.

The location of the wound is an important factor in the development of infection. Not only are the various tissues known to have different powers of local resistance to infection, but the resistance of these tissues also varies with their location in the body. Lacerations of the face and neck are prone to heal kindly unless they are in communication with the mouth and pharynx. The face, scalp, back and thorax are affected but rarely by gas gangrene, while the muscular areas of the thigh, calf and buttocks are particularly prone to develop gas bacillus infection.

The symbiosis of aerobes and anaerobes may favor the multiplication of the bacteria of gas gangrene and putrefaction. Whether an infection once implanted remains

localized, spreads extensively or invades the blood stream is dependent on such factors as the nature of the wounded tissue, the virulence and dose of contaminating bacteria and the resistance of the host.

The physical condition of the patient at the time of the injury may also play an important part in the development of infection. His general powers of resistance may have been reduced by shock, fatigue, exposure, continued pain, hunger, malnutrition, thirst and loss of blood.

Finally the type and thoroughness of treatment instituted play a great part in determining whether or not a wound will become infected. This subject will be taken up in detail in another article.

The local and general use of the sulfonamides has been found to be of only limited value in the prevention and control of infection in traumatic wounds. In the carefully planned and executed study of wounds conducted during the past one and one-half years by the Committee on Surgical Infections under the auspices of the National Research Council,²³ the local and general use of sulfonamides in soft tissue and compound fracture wounds has failed to decrease the incidence of serious or trivial infection. It has seemed to help in the localization of any infection that may develop in the wound. On the other hand the local use of sulfanilamide and the general use of sulfadiazine have been of great value in the prevention and control of infection complicating penetrating wounds of the abdomen, chest and central nervous system. It remains to be seen whether the prophylactic use of penicillin or allied agents will decrease the incidence of local wound infection.

SUMMARY

The bacterial flora of traumatic wounds has been found to consist of a variety of organisms, roughly falling into two groups: (1) fecal bacteria and (2) pyogenic bacteria. The bacteria of fecal origin include aerobic forms such as enterobacilli and enterococci, as well as anaerobic forms such as *Cl. tetani*, *Cl. perfringens* and *Cl. novyi*, *Cl. septicum* and other spore formers associated with gas gangrene. The pyogenic group consists of staphylococci, streptococci, microaerophilic streptococci and anaerobic streptococci.

When the wound is first seen by the surgeon and throughout the first week the flora of war wounds consists principally of the bacteria of fecal origin introduced into the wound along with soil, skin, hair, clothing or other foreign bodies. It is during this period that gas gangrene and tetanus are apt to develop. During the second week in open wounds the fecal organisms are gradually replaced by the staphylococcus, streptococcus and *P. aeruginosa*. The sources of these pyogenic bacteria are extremely interesting since the evidence indicates that they are principally of human origin and that in the great majority of instances they are introduced into wounds some time after injury, particularly during the period of hospitalization.

To minimize this secondary infection, various procedures have been devised, including early application of sterile first aid dressing without probing of the wound, masking of both the patient and the medical personnel during dressings, the use of oil on ward floors to eliminate dust during sweeping, and careful aseptic dressing technic designed to prevent the mechanical transfer of pyogenic infection from one wound to another, as well as dust and air droplet contamination.

22. Reid, M. R.; Zininger, M. M., and Merrell, Paul: Closure of Abdomen with Through and Through Silver Wire Sutures in Cases of Acute Abdominal Emergencies, *Ann. Surg.* 98: 890-896 (Nov.) 1933.

23. Meleney, F. L.: The Study of Infection in Contaminated Accidental Wounds, Compound Fractures and Burns, to be published.

The factors important in determining the development of infection include the virulent type of contaminating bacteria, the nature, duration and location of the wound, the presence of foreign bodies, the general condition of the patient and the type and thoroughness of treatment.

To prevent primary infection of the wound, débridement has replaced the use of wound disinfectants. The success of primary débridement is dependent on the observation of well known principles of surgical therapy: (1) removal of all foreign bodies and devitalized tissue within the first six or eight hours, (2) suture of tissues without tension and with a minimum amount of buried ligatures and sutures, (3) maintenance of an adequate blood supply and (4) apposition of live tissue to live tissue for the promotion of healing.

The local and general use of sulfanilamide and other chemotherapeutic agents has so far failed to decrease the incidence of local infection in soft tissue wounds. The general administration of the sulfonamides, particularly sulfadiazine, to wounded patients is indicated for its localizing action on any developing infection, its prevention of septicemia and its prevention or attenuation of postoperative pneumonia. The type of treatment, the time of its institution and the skill of its administrator largely determine the effective prevention of wound infection.

THE MANAGEMENT OF WOUNDS AND INJURIES OF THE HEAD

JOSEPH P. EVANS, M.D.

CINCINNATI

The importance of injuries of the head rests chiefly in the damage that may be done either directly or indirectly to the brain, and it is with this problem that the surgeon is chiefly concerned. At the risk of oversimplification, the subject may be divided into four main sections: injuries to the scalp, injuries to the cranium, meningeal hemorrhage, and physiologic and anatomic damage to the brain itself, either primary or secondary to disturbances in any one or more of the other divisions.

SCALP INJURIES

The scalp is made up of skin, subcutaneous tissue, aponeurosis and an underlying layer of loose areolar tissue which divides the aponeurosis from the periosteum of the skull. The aponeurosis forms a subaponeurotic compartment and is usually an effective barrier against infection. Once, however, infection has penetrated through the aponeurosis there arise two possibilities: a widespread subaponeurotic infection, and involvement of the periosteum and the underlying bone. It must also be borne in mind that penetrating vessels descend from the scalp through the diploic channels of the bone into the leptomeninges. Another point of anatomic importance is the great vascularity of the scalp, which is abundantly supplied with vessels coursing through the subcuticular layer. Thus, though uncontrolled bleeding from the scalp may lead to exsanguination, it must also be recognized that this abundant vascularity favors healing of the scalp, even under unfavorable circumstances.

Injuries to the scalp may consist of simple lacerations, widespread contusions from injury with blunt objects,

or avulsions of the scalp with and without loss of the periosteum.

Treatment consists in thorough cleansing of the wound and débridement. The first step in cleansing is a wide, close shave followed by thorough irrigation of the laceration with sterile isotonic solution of sodium chloride, following which the prepared area with the exception of the wound itself should be freely painted with merthiolate or other acceptable antiseptic. The region may then be locally blocked with anesthetic solution (1 per cent procaine). If the wound is a clean laceration, no débridement is necessary. However, any devitalized tissue which may be present should be debrided widely.¹ If the periosteum is soiled, this must also be removed, following which the entire area should again be washed thoroughly but gently with a quantity of isotonic solution of sodium chloride, so that mechanical cleansing is accomplished.

If the wound is of recent infliction and time is available, it is quite permissible to bury silk sutures in the aponeurotic layer. In this fashion a less evident scar is obtained. On the other hand, a through and through closure with interrupted silk sutures or with dermal suture material is acceptable.

In those instances in which a large quantity of scalp tissue has been lost, it may be necessary to undermine the aponeurosis and shift scalp substance. Sometimes even counterincision is required. The scalp will stand a rather surprising degree of tension, and in some instances wounds which appear to be closed unusually tightly will heal satisfactorily. If the periosteum has been left intact, it is permissible either to shift a pedicle graft at the time or to take Thiersch grafts for the covering of wide areas of denuded scalp.

Drainage is usually unnecessary if the wound is not more than six hours old. If more than twelve hours old it is probably wise to use a small rubber tissue drain inserted through a separate stab opening. A dry dressing may then be applied and fixed in place either with collodion or with liquid adhesive. If the wound is extensive or if there are multiple wounds, it may be wiser to apply a large head dressing.

Wounds which have not been subjected to this treatment and which are infected must be widely opened, and subaponeurotic abscesses may require very extensive multiple drainage.

In clean wounds the use of sulfanilamide should not be necessary in civilian practice. In those occasional instances in which it may be anticipated that there will be extensive delay before closure can be accomplished, dusting of the wound with sulfanilamide would seem to be a wise procedure.

CRANIAL INJURIES

The malleability of the skull in younger persons is an important point to bear in mind in evaluating the severity of head injuries in children. Egg shell and stellate fractures appear to be more frequent than in adults, in whom the inner and outer tables are relatively thick and rigid. Other anatomic points of importance are the presence of air sinuses, which make their appearance during early childhood, the presence of various important foramina through which pass major vessels and cranial nerves, and the presence of large venous sinuses closely affixed to the skull by virtue of the fact that the outer layer of the dura comprises the inner layer or the periosteum of the skull.

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1. Altemeier, W. A.: The Treatment of Fresh Traumatic Wounds, this issue, p. 0000.

Injuries to the bone may be of several types: simple fractures, comminutions, depressed fractures and compound fractures made up of the three previous types. The recognition of the various types depends chiefly on x-ray studies, though percussion may sometimes give a clue to the presence of fracture. Palpation in closed wounds may oftentimes be misleading because of the heaping up of the aponeurosis, which makes the adjacent areas seem depressed. In compound wounds palpation with a gloved finger may be permissible, but this should be carried out by the person who is going to assume responsibility for immediate definitive treatment.

Treatment of simple and comminuted fractures is not required for the fractures per se. Depressed fractures require elevation; this is particularly true of those which lie over large vascular channels or over the sensorimotor cortex, in the latter instance because of the possibility of serving as an irritative agent responsible for later convulsive seizures. At times rather nice judgment may be required to decide whether a depression is of sufficient extent to require elevation. More extensive fractures, of course, which compromise the capacity of the intracranial chamber must be lifted.

Treatment of compound wounds with underlying simple fracture is essentially that of the treatment of scalp wounds, but when depressed fragments lie underneath these must be elevated. If the dura is not torn, the problem is relatively simple. If there are associated lacerations of the brain, débridement of the cerebral issue may be necessary, a point which will be discussed in a later section.

MENINGEAL BLEEDING

The dura is very closely apposed to the undersurface of the skull, and it is within the outer layer of the dura that the meningeal vessels run. It is generally true that the bleeding which occurs in the extradural space is of meningeal origin, bleeding usually being from the middle meningeal artery. There is evidence, however, that a somewhat slower type of extradural accumulation of blood may occur when the major venous sinuses are lacerated and blood has the opportunity to make its way out into the extradural space.² The subdural space, on the other hand, is not merely a potential but an actual space which contains a small amount of fluid of high protein content at all times, this fluid probably serving as a lubricating medium for the brain within the skull case. Blood which makes its way out into the subdural space has no means of egress and it serves as a foreign body which, if present long enough, becomes encapsulated by a barrier of connective tissue thrown up from the inner surface of the dura.³ The inner portion of the capsule is made up of similar fibrous tissue, which may be derived from the arachnoid rather than from the dura. The larger cortical veins, when leaving the surface of the brain to enter the median longitudinal sinus, traverse the subdural space. In so doing they travel unsupported through the space for a distance sometimes as great as 2 cm. Movements of the brain within the dural envelope, which is firmly attached to the skull, may result in tearing of these thin walled vessels. It is usually from such vessels as these that subdural accumulations of blood occur,⁴ though

sometimes they are secondary to laceration of the brain with tearing of the arachnoid and outpouring of blood through the arachnoid into the subdural space.

From the practical point of view of the treatment of head injuries, blood which is present in the subarachnoid space does not require consideration here, because of the fact that the subarachnoid space is relatively narrow and is filled with arachnoidal trabeculations which make surgical drainage not feasible. Moreover, the endothelial cells which line the subarachnoid spaces very rapidly become mobilized and serve as phagocytes which break down the blood and dispose of it more effectively than could otherwise be accomplished.⁵

Therefore one is concerned surgically with epidural and subdural bleeding. The classic diagnostic picture of epidural hemorrhage occurs in a person who, following the receipt of a head injury, has a period of clarity which is gradually followed by the onset of a deepening level of coma, secondary to compression of the brain. A "hemispherical" weakness develops which classically is supposed to appear first in the face, then spread to the arm and leg of the opposite side. The ipsilateral pupil is then described as dilating as the result of stretching of the third nerve. Actually this classic picture may be seen rather rarely. From the practical point of view differentiation between epidural and subdural hemorrhage is unnecessary. The essential points to bear in mind are that an accumulation of blood over one hemisphere results in compression of the brain and deepening coma, and dysfunction of the hemisphere which is manifested chiefly by pareses of varying degrees. In some instances dysfunction of the speech mechanism with resultant dysphasia may be the only localizing sign. In other instances a homonymous hemianopsia may indicate compression of an occipital lobe. There is no rule of thumb for treatment of head injuries, but the closest approach to such a rule is that "localization necessitates operation." Hence, given a patient with a history of head injury, the development of such signs warrants a consideration of the diagnosis of epidural or subdural hematoma. Localized headache may also be of help. If lumbar puncture indicates an increased intracranial pressure, whether the fluid is bloody or not, one has additional evidence in favor of the diagnosis. Occasionally it is possible to detect in a true anteroposterior view of the skull a displaced, calcified pineal gland.⁶ This sign, when present, may be of considerable help in arriving at a decision. Usually bleeding into the extradural space is rapid, since the blood is generally derived from the middle meningeal artery. Per contra, bleeding into the subdural space is generally manifested by the slow development of signs and symptoms because the bleeding is usually of venous origin. However, neither rule is absolute.

From the practical point of view the necessity of differentiating preoperatively between epidural and subdural bleeding is not a matter of great moment but rather is an academic matter. This is true because the treatment in the two instances is the same. Blood present in either space is a foreign body and is acting as a compressing mechanism and must therefore be evacuated. Epidural bleeding generally manifests itself

2. Munro, Donald, and Maltby, G. L.: Extradural Hemorrhage: Study of Forty-Four Cases, *Ann. Surg.* **113**: 192 (Feb.) 1941.

3. Munro, Donald, and Merritt, H. H.: Surgical Pathology of Subdural Hematoma Based on Study of One Hundred and Five Cases, *Arch. Neurol. & Psychiat.* **25**: 64 (Jan.) 1936.

4. Leary, Timothy: Subdural Hemorrhages, *J. A. M. A.* **103**: 897 (Sept. 23) 1934.

5. Sprong, Wilbur: Disappearance of Blood from Cerebrospinal Fluid in Traumatic Subarachnoid Hemorrhage: Ineffectiveness of Repeated Lumbar Punctures, *Surg., Gynec. & Obst.* **58**: 705 (April) 1934.

6. Naffziger, H. C.: Method for Localization of Brain Tumors—the Pineal Shift, *Surg., Gynec. & Obst.* **40**: 481 (April) 1925.

fairly definitely within a matter of a few hours or at most several days. An acute subdural hemorrhage may be difficult to differentiate from it. In either instance treatment of choice in my opinion is the making of bilateral subtemporal exploratory openings. These may

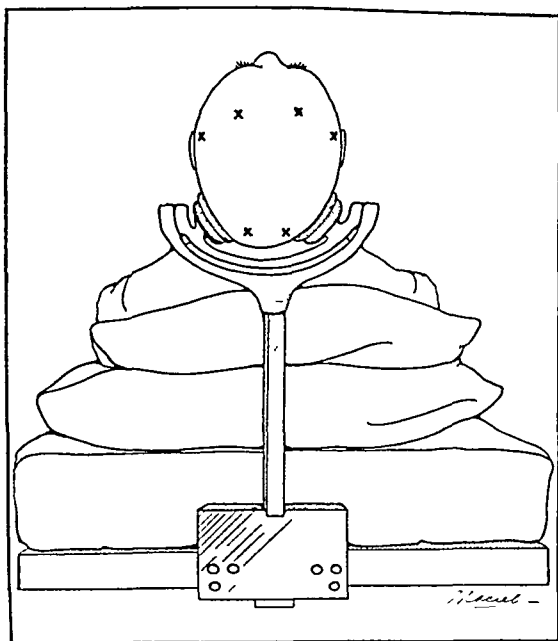


Fig. 1.—Support of the head on the rest devised by Dr. Richard Light. The head of the table may be raised to facilitate approach to the occipital region.

generally be placed under local anesthesia, a linear incision is made in the skin just anterior to the tip of the ear in the direction of the inferiorly lying fibers of the temporal muscle. Care must be taken not to lose excessive blood from the temporal artery. The temporal muscle is split, the fibers are retracted, and with a perforator and burr an opening is made in the squamous portion of the temporal bone. If epidural bleeding is immediately met, the opening must be quickly enlarged to about the size of a silver dollar (38 mm.) and with suction and the brain spoon it is usually possible to evacuate without too much difficulty the extradural accumulation. The bleeding arterial points must then be controlled either with silver clips or by use of the electrocautery. Generally the exposure of the area is relatively simple because the clot has already dissected the dura away from the bone and there may be actually an abundance of room in which to work, so that the exposure of the foramen spinosum, the point of entry of the middle meningeal artery, may be a relatively simple matter. All bleeding points must be carefully located. Thereafter it may seem wise to open the dura in search of further bleeding in the subdural space. In any event, if no extradural bleeding has been found the dura must be opened and the subdural space explored. Acute bleeding in the subdural space is usually fluid, probably for two reasons, mixing with the cerebrospinal fluid of varying degrees and, secondly, because the flagellating effect of brain pulsations causes defibrination of the slowly escaping blood. If this is the case, drainage is usually accomplished with relative ease. Occasionally a subdural accumulation of blood may be solid clot and it may prove difficult to evacuate it, even through a fair sized subtemporal opening. In these instances recourse may be had to the turning of a bone flap.

I have found it a wise procedure to have the whole head prepared for operation and to support the head on a Light headrest which permits making of an opening at any point in the head. If the subtemporal openings are unproductive of blood, occipital openings are made in the hope of meeting with a hematoma, or if these openings also are clear of blood they may later be utilized for ventriculography if the problem has not resolved itself completely.

In those instances in which the clinical picture requires solution days or even months after the injury, the head is generally supported in a similar fashion and three openings are placed on each side, one in the frontal, one in the occipital and one in the subtemporal region. Again if the problem does not resolve itself on inspection of the multiple burr openings, ventriculography may be resorted to (figs. 1 and 2).

The supportive treatment of such patients may be most exacting. They are frequently comatose for long periods following operation. Careful attention must be given to fluid and protein balance, to aspiration of the accumulations within the trachea, and frequently administration of one of the sulfonamide drugs is indicated as a prophylactic against the development of pneumonia. Special nursing care is extremely advantageous among the sicker of these patients.

BRAIN TRAUMA

Definitions are essential for clarity of thinking in dealing with this phase of the problem. My associates and I reserve the term cerebral concussion for cases

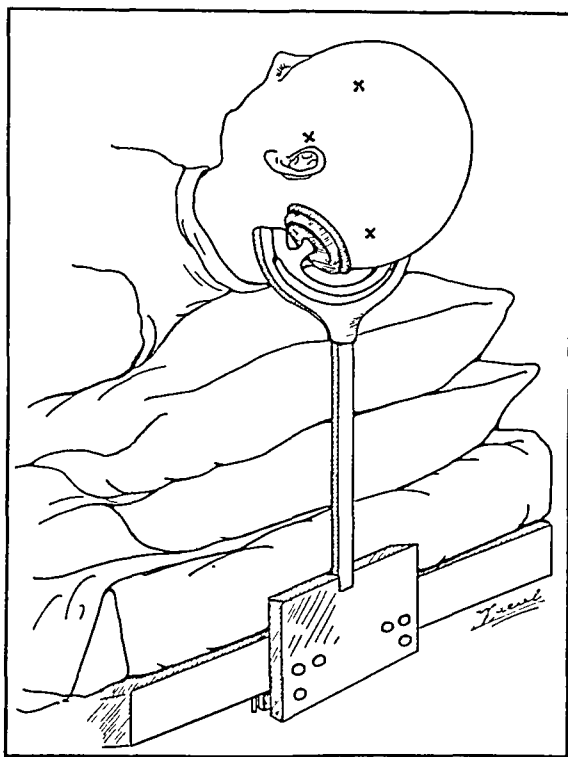


Fig. 2.—Side view of head rest

in which consciousness is lost, and we regard concussion as a purely physiologic state in which neural activity is temporarily disrupted without there being demonstrable anatomic change. The disruption of neural activity may precipitate abnormal physiologic mechanisms which lead to later organic alterations, and

it would seem likely that prolonged states of unconsciousness may be due to such anatomic alteration, so that we prefer to use the term concussion for transient states of loss of consciousness, lasting minutes rather than hours.

The next accepted subheading in the classification of injuries to the brain is cerebral contusion, which represents a definite pathologic state in which there are petechial hemorrhages, whose mode of production need not concern us here but which I believe may be the result of increased permeability of the vessel wall.⁷ This state, which is easily recognized pathologically, may escape detection clinically if the bruised area of the brain lies in a quiet area. In the nonsilent zones of the brain contusion may produce some clinically recognizable disturbance of neurologic function, such as alteration in the reflexes or weakness.

Actually we recognize an intermediate state antedating the development of cerebral contusion, that of cerebral edema, in which an antecedent escape of fluid occurs before the condition becomes serious enough to permit the escape of red blood cells into the extravascular spaces.⁸ The clinical recognition of this condition is dependent chiefly on the height of intracranial pressure, but conceivably it may also result in dysfunction of cerebral gray matter.

Cerebral laceration is that condition in which there is actual rupture of continuity of intracerebral tissue. Clinically there is generally severe disturbance of neural activity manifest in such individuals, and it is apt to be associated with prolonged periods of unconsciousness.

No discussion of brain trauma would be complete without a further elaboration of the subject of cerebral concussion, a problem which has recently been considerably clarified by the research of Denny-Brown and Russell.⁹ They introduced evidence to show that loss of consciousness is dependent on either rapid acceleration or rapid deceleration of the brain, conditions which are associated with disruption of certain basic neural mechanisms, particularly those of the hind brain. This concept has considerable practical importance. To acceleration and deceleration concussion must be added that of compression concussion, which is the disruption of neural activity that occurs in the face of rapidly increasing intracranial pressure, since this may occur with extradural or subdural bleeding. It seems likely that there is a third form of loss of consciousness, which is associated with diffuse damage of the brain tissue. Certainly, patients with severe head injury unassociated with compression may remain comatose for a period of days or even weeks, and in these instances the persistent loss of consciousness would appear to be dependent not on the initial acceleration or deceleration (which may even have been absent) but rather on diffuse neural damage.

There is no effective treatment known for cerebral concussion due to acceleration or deceleration. The importance of the concept lies chiefly in the adoption of prophylactic measures designed to reduce the frequency of its occurrence. A person who has suffered transient loss of consciousness is, in our practice, placed at bed rest for a period of one to three weeks. There

is a tendency recently in the hands of neurologic surgeons to shorten this period in the belief that psychogenic factors which may contribute to post-traumatic headache and dizziness are nursed by oversolicitude. This would indicate that the length of the rest period must be decided with care.

The clinical recognition of the presence of cerebral edema is at best difficult, so that judgment as to the effectiveness of therapeutic methods employed is perilous. The same general principles of bed rest are applied in cases of edema and of contusion. In addition there are theoretical reasons for feeling that oxygen therapy may be of value, possibly resulting in the facilitation of oxygen transport across the barrier between blood vessels and brain tissue, which barrier presumably is heightened by the accumulation of perivascular fluid. Likewise the treatment of cerebral contusion is on a somewhat empirical basis, which consists again of supportive treatment, bed rest and oxygen therapy. Morphine is to be avoided because it is a respiratory depressant. We are not ardent advocates of the use of hypertonic solutions,¹⁰ but rather are inclined to question their effectiveness and to raise the query of whether it is not possible that they may even in certain circumstances do harm to the state of the vessel wall. We attempt to maintain a fluid balance which is about normal for that individual at bed rest and do not subscribe to the theory that dehydration is of value. Neither do we employ frequent lumbar puncture for drainage, though occasionally we resort to puncture to relieve the severe headache which may accompany traumatic subarachnoid hemorrhage.

Sedation may at times become imperative. We employ moderate amounts of bromides and chloral hydrate for restlessness. Acetylsalicylic acid and acetophenetidin may be helpful in controlling headache and occasionally recourse may have to be had to codeine. But morphine, it should be reiterated, is to be avoided.

Proper attention to oral hygiene and to aspiration of the throat is imperative for the comatose person. Semi-Fowler's position, because it facilitates venous return from the head and facilitates swallowing, is probably the best position for those individuals not in shock. Very occasionally it may seem desirable to place the patient in the ventral position with the head low to permit drainage of oral secretions.

The débridement of lacerated cerebral tissue is a matter which should ideally be left to the neurologic surgeon or a surgeon familiar with neuroanatomy and neurophysiology. This because of the fact that a nicety of judgment is essential in the proper handling of such wounds. Likewise the removal of foreign bodies may better be left to such individuals. In those instances in which they can be removed without greater extension of damage, their removal is permissible. However, further interference with function is to be avoided.

SUMMARY

Head injuries may be divided into four general groups: those affecting the scalp, those of the skull, those in which bleeding of epidural or subdural nature has occurred, and finally those which affect cerebral substance per se. These injuries may of course occur individually or in combination.

(This symposium will be concluded in the next issue)

7. Evans, J. P., and Scheinker, I. M.: Massive and Petechial Post-Traumatic Hemorrhage, to be published.
8. Evans, J. P., and Scheinker, I. M.: Post-Traumatic Cerebral Edema, to be published.
9. Denny-Brown, D. E., and Russell, W. R.: Experimental Cerebral Concussion, *Brain* 64: 93 (Sept.) 1941.

10. Masserman, J. H.: Effects of Intravenous Administration of Hypertonic Solutions of Sucrose, with Special Reference to Cerebrospinal Fluid Pressure, *Bull. Johns Hopkins Hosp.* 57: 12 (July) 1935.

THE BRITISH ARMY BLOOD
TRANSFUSION SERVICE

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* The following brief account gives a description of the British Army Blood Transfusion Service from its inception to the present time and shows how big an organization has had to be developed from very small beginnings in order to meet the demands of war in the large number of theaters now existing.

The original technical staff, drawn almost entirely from the laboratories of the Royal College of Surgeons and the Middlesex Hospital, were selected before the war, and agreement was obtained for them to mobilize and start work in a west country region as soon as needed. A basic panel of some 5,000 donors was obtained before war broke out. The birth pains of the service were severe, but not protracted. Appropriately, the unit was first accommodated in a vacated maternity ward of a large hospital, which engineers converted into the necessary laboratories in about forty-eight hours; this had to suffice until the separate buildings were completed early in 1941. From these temporary quarters both the French and the Norwegian campaign were supplied with transfusion fluids and equipment, largely by an air service which carried stored blood to the transfusion units operating with the armies themselves. During the first six months of the "phony" war the unit had ample time to develop its technic of blood collection, to raise a big donor panel, to carry out considerable research work on the keeping properties of blood, especially when transported overseas, on the merits of the various¹ blood substitutes and to develop a technic for the filtration of plasma.² This last proved to be of inestimable service for the future. In 1941 the service was presented with its own plasma (or serum) drying plant by the Silver Thimble Fund of the Women of India, which, owing to the severe bombing of the headquarters itself and which even more frequently involved the services of gas, water and electricity, had to be erected at a shadow headquarters some 35 miles away. The drying plant has now an output of twelve to fourteen hundred 400 cc. bottles a week; it is of the latest pattern, utilizing the principles of Greaves and Adair³ and the spin-freezing technic.⁴

Supplies of dried plasma have been considerably augmented by material dried in the much bigger Medical Research Council drying plant.

In 1942 the requirements had so increased that the service had to be allotted another region from which to obtain donors, while the arrival of United States forces necessitated the provision of additional staff and equipment for the preparation of the large amounts of crystalloid fluids required by them. The Transfusion Service now operates in some nine hundred different donor centers. It has a staff of about four hundred, of which 80 per cent are women (V. A. D.'s and A. T. S.'s)^{4a} and it supplies transfusion fluids (protein and crystalloid) and equipment to the whole British army overseas, in

every theater of war and in every outlying station from Iceland to the Cape and from England to the Far East. In addition, the basic requirements of the forces at home are cared for and most of the civil needs in the two regions in which the service operates. The civil transfusion services have always generously supplemented the army resources whenever the need has arisen.

The main functions of the Army Transfusion Service are the provision of supplies as stated, the mobilizing, equipping and training of special transfusion units for service overseas and the training of all ranks of the Royal Army Medical Corps in resuscitation work. In this respect, the British army differs from all other armies, allied or enemy, in that it has provided a distinct transfusion service with its own noncommercial source of supply of all transfusion fluids and equipment and with specially trained distinct mobile resuscitation teams which are self contained and which can be attached to any appropriate medical unit overseas.

REGISTRATION OF DONORS

The Donor Registration and Publicity Department has a panel of approximately 350,000. Major publicity campaigns are conducted six times a year, while minor campaigns in factories, villages and small towns are in continuous operation in a definite cycle in relation to the visits of the blood collecting teams. A donor panel is always a wasting asset and cannot be maintained or increased without continuous publicity. It has been clear too that the public responds well when the war news is active, irrespective of whether it is good or bad, but it is apt to slack off during stagnant periods unless constantly appealed to. The best results, with the highest turn up at the center, are obtained by small local publicity campaigns just prior to the visit of the blood collecting teams. Nationwide appeals are ineffective unless the personnel are available to strike while the iron is hot. The public resents being appealed to urgently for volunteers when afterward those same volunteers are not called on for several months.

COLLECTION OF BLOOD

Bleeding is carried out by fifteen mobile self-contained fully equipped teams, each consisting of a medical officer, four V. A. D.'s, two A. T. S. drivers and an A. T. S. orderly. The medical officer is frequently a woman officer of the Royal Army Medical Corps who has all the privileges of a male officer and is likewise subject to military discipline. The principle is that the teams go to the donors, who are called to a nearby convenient center. Each team carries in its two vehicles (a lorry, equipped with a refrigerator, and a four seater car) the full equipment for converting any reasonable sized room into a miniature hospital ward in about twenty minutes, as well as facilities for supplying comforts and refreshment to donors. The whole area covered by the service is regionalized so that teams are detached and quartered in a large town, whence they bleed the surrounding area for a distance of 25 to 30 miles. The takings are ferried in refrigerator trucks back to headquarters, whence the team is serviced with fresh apparatus, clean linen and comforts. For steady work a team is expected to obtain from 70 to 90 pints of blood daily. In times of emergency, over short periods of time, a single team has obtained as many as 320. From each donor 440 cc. of blood is collected into 100 cc. 3 per cent sodium citrate, to which is added 20 cc. of 10 per cent dextrose with the special apparatus to be described.

1. Buttle, G. A. H.; Kekwick, A., and Schweitzer, A.: *Lancet* 2: 508, 1940.
2. Bushby, S. R. M., and Whitby, L. E. H.: *J. Roy. Army Med. Corps* 76: 4, 1941.
3. Greaves, R. I. N., and Adair, M. E.: *J. Hyg.* 36: 507, 1936.
4. Lanyon, E. C. G.: *J. Hyg.* 41: 111, 1941. Greaves, R. I. N.: *J. Hyg.* 41: 489, 1942.
4a. V. A. D. = Voluntary Aid Detachment. These are women who are not trained nurses, but who do nursing duties under supervision. A. T. S. = Auxiliary Territorial Service (women). These are the khaki dressed "soldiers" of Britain's female army.

TRANSPORT OF BLOOD

In the French and Norwegian campaigns a whole blood service was maintained to the overseas forces. Distance now prohibits such supplies from the home country, but an ample blood service is provided by base



Fig. 1.—Insulated box for air transport of blood, with insert in lid. Capacity 20 pints of blood in crates with administration sets. Weight 110 pounds. Maintains temperature at 4 to 6 C. for eight hours. (Photograph by courtesy of Norman K. Harrison.)

transfusion units, which are to be found in every theater of war. These units are the local opposite number of the big central organization at home; they are equipped with refrigerator trucks; blood is obtained from base stationed troops. Only group O blood is supplied. This is double checked for group and submitted to Kahn's test before dispatch. Early experiments with transport of blood to France had shown that, if the bottle was filled right to the top to prevent slopping, the blood traveled well. "Topping" is carried out with a special machine with which a fine needle is made to pierce the bung of the bottle; with a two way connection, air is sucked out of the bottle and dextrose solution admitted until the bottle is full; the track of the needle is self sealing on withdrawal. The main transport is by air in insulated boxes containing ice inserts which maintain a temperature of 2 to 6 C. for eight hours (fig. 1). The weight of one box containing 20 pints of blood is 110 pounds.

PROCESSING OF BLOOD

The majority of the blood taken by the home depot is processed to form plasma, which is either dried for export to any theater of war, more especially theaters in tropical countries, or supplied in fluid form for use in temperate climates and especially for such expeditions as commando raids. Early experiments¹ had indicated that plasma had certain advantages over serum, while considerable clinical experience during bombing raids

produced ample evidence of the efficiency and safety of plasma.² The main problem with plasma has been the making of a guaranteed sterile product which could be judged fit for use according to its macroscopic appearance. The common precaution of siphoning off in a closed system and storing the plasma in the frozen solid state until just before use is not applicable to active service conditions. Clarification and filtration is the obvious method for obtaining a clear sterile product, but the filtrate invariably clots, especially if the convenient Seitz asbestos pad filtration method is used. Clotting occurs because prothrombin is activated to form thrombin by the magnesium of the asbestos pad. The difficulty can be eliminated by frequent washing of the pad with weak alkali to remove the retained prothrombin,³ or by filtering at such a pH that prothrombin cannot be activated.⁴ This last method is the one now used. The resulting plasma is gin clear and stable; it has been exported as far as India, where it has been used with success in the Burma campaign. This fluid plasma needs to be kept cool but need not be refrigerated. Postfiltration clotting is encouraged by shaking; bottles are therefore filled right to the top.

Dried plasma is also made from filtered plasma; it is disposed in units of 400 cc., which are spun frozen⁴ in a standard transfusion bottle (fig. 2) and the water

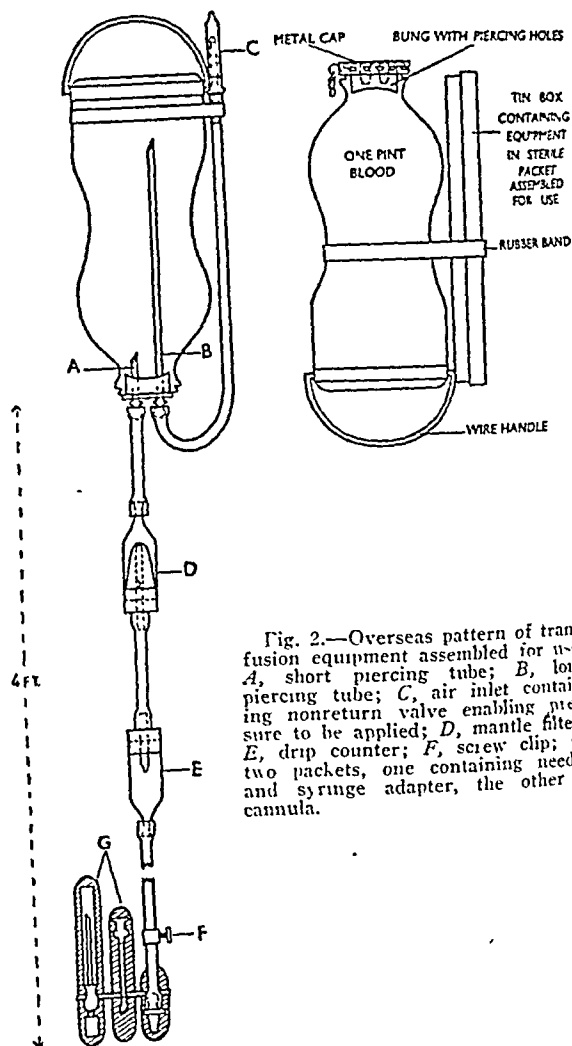


Fig. 2.—Overseas pattern of transfusion equipment assembled for use: A, short piercing tube; B, long piercing tube; C, air inlet containing nonreturn valve enabling pressure to be applied; D, mantle filter; E, drip counter; F, screw clip; G, two packets, one containing needle and syringe adapter, the other a cannula.

sublimated from the frozen state.⁵ Each bottle exported is accompanied by 400 cc. of pyrogen free distilled water, also contained in a transfusion bottle, together with the apparatus for administration.

5. Kekwick, A.; Maycock, W. d'A., Marriott, H. L., and Whitby, L. E. H.: *Lancet* 1: 99, 1941.
6. Bushby, S. R. M., and Whitby, L. E. H.: *J. Roy. Army M. Corps* 78: 255, 1942.

TRANSFUSION EQUIPMENT

All transfusion fluids, wherever exported, are accompanied by administration apparatus assembled at the home depot; this is packed in tins sterilized for immediate use (fig. 2). In principle, the apparatus is the



Fig. 3.—Wicker parachute basket for dropping supplies of transfusion fluids. (Photograph by courtesy of Norman K. Harrison.)

same whether it is to be used for blood, fluid plasma, dried plasma or a crystalloid solution; the only modifications are in the bungs, placed in the different bottles, but these permit any administration set to be used. All bottles are standard throughout all the services, naval, military, Royal Air Force and civil. Of other equipment, the service has devised and issued special boxes to meet the transfusion needs of military hospitals, field ambulances and troopships as well as complete apparatus for full resuscitation work by mobile field transfusion units and by the air borne medical units; these last are dropped by parachute (fig. 3).

GROUPING SERUM

Owing to storage difficulties, the army is issued dried grouping serum (human) which needs no refrigeration. Drying is carried out in the plasma drying plant. The serum is disposed in tubes, the equivalent of 1 cc. of the fluid, containing indicator silica-gel, which ensures complete dehydration as well as indicating fitness for use. Group A serum is colored amber with acriflavine; group B serum is colored blue with methylene blue. The minimum titer is 1 in 32 against A_2 cells and 1 in 64 against B cells.

PACKING AND DISPATCH

Transfusion fluids are packed in boxes suitable for manhandling overseas, which contain the appropriate number of administration sets and, where necessary, water for reconstitution. The weight of a box is approximately 56 pounds (fig. 4).

TRAINING AND MOBILIZATION

Regular courses of instruction in resuscitation and transfusion work for officers and other ranks have been held since 1940; many United States officers have attended this school, as well as officers from the Royal Navy, Royal Air Force, Civilian Emergency Medical Service and several of the allied forces. The home

headquarters is the center for the mobilization, equipping and training of all transfusion units proceeding overseas, including such specialties as refrigerator maintenance and repair, autoclave duties, crystalloid preparation and assembly, reconditioning and repair of transfusion apparatus.

OVERSEAS ORGANIZATION

In every theater of war there is a base transfusion unit, which is the link with the home depot. The main functions of these units are to estimate, obtain from home and distribute supplies and transfusion equipment to the force. They are also equipped for the production of crystalloid solutions, for the assembly of apparatus, for the servicing and repair of refrigerators and for the exploitation of local resources, usually base troops, for the obtaining of supplies of whole blood. This is sent forward by air in insulated boxes (fig. 1) by road by refrigerator truck or sometimes along a coast in the refrigerator of a hospital ship. When the base transfusion unit is within reasonable air distance of the home unit, as in the French campaign, the latter is responsible for the supply of blood. It may be mentioned in passing that all with experience, including the Germans, have found it impracticable to obtain supplies of blood on the spot from medical personnel or the walking wounded; in busy times no more than two or three transfusions a day can be so performed.

In every corps there are a number of mobile field transfusion units, which are self contained, have their own transport, including a refrigerator mounted on a lorry, and are fully equipped for the performance of resuscitation in the field. They are serviced by the base transfusion unit and, being equipped with a refrigerator, are the units which receive the supplies of blood sent from the base. During active operations the field transfusion units are attached wherever their services are



Fig. 4.—Standard packing for all exported transfusion fluids, with administration sets. Weight 56 pounds. (Photograph by courtesy of Norman K. Harrison.)

most needed; they have operated mainly in collaboration with field surgical units to form complete surgical centers at field ambulances, field dressing stations and casualty clearing stations.

The virtues of this separate transfusion service, which is peculiar to the British army, are that the personnel are especially trained and highly skilled, their supplies

are the special concern of particular units instead of being part and parcel of general medical supplies, and this is important when perishable (and potentially dangerous) fluids such as blood are concerned. For example, the base unit is responsible for obtaining blood and arranging for prompt air transport, and the field unit is responsible for meeting the plane at the forward landing ground and transferring the blood to its refrigerator without delay. This does not mean to say that the ordinary general duty medical officer does no transfusion work. All medical units are equipped to do transfusion work, but their other multiple duties prohibit large scale work, and in selected centers there is a definite need for a specially trained full time officer and staff. The personal element in the service has been one of its greatest successes and has created a fine *esprit de corps*; the reputation and activity of the field transfusion units have become a byword among surgeons in all theaters of war.

BLOOD DONORS

The number of blood donations to the army service to December 1943 was approximately 400,000; these have mostly been given by the general public, some persons having donated seven or eight times; home based troops, Royal Air Force ground staff and Royal Naval Dock-

	Whole Blood × 560 Cc.	Dried Plasma × 400 Cc.	Fluid Plasma × 560 Cc.	Crystal- loids × 560 Cc.	Admission- tion Sets
B. E. F. and Norway.....	2,580	.....	635	3,000	2,580
Middle East.....	30,170	.....	5,250	1,000	51,162
North Africa.....	20,000	.....	0,000	28,500	25,536
India.....	16,225	.....	3,500	.....	10,184
ers-In.....	4,200	.....	3,000	.....	4,500
Outlying stations.....	0,000	.....	2,000	4,500	10,437
U. S. forces.....	.....	.....	.....	131,267	.....
Home forces.....	800	22,000	25,534	6,000	68,450
Civilian and other services..	5,410	2,600	5,500	.....	7,914
	8,790	101,601	51,119	177,267	181,172

yard staff have also contributed. There have as yet been no fatalities among donors. The accident and complaint rate has been 1 per 3,678 bleedings, of which the following is an analysis: hematoma 27, cellulitis 8, thrombosis 4, accidents due to fainting 16, dermatitis 10, unclassified hysteria and so on 22, total 87. Claims for compensation have amounted to 13, giving a rate of 1 in 24,615. Twelve of these claims have been trivial, for such things as spectacles broken while fainting, totaling £72.2.0. The grand total has been largely made up of one claim for £60, being loss of wages owing to absence from work, following on cellulitis of the arm. All manufacturing firms have cooperated most loyally in allowing employees time off for blood donation without claiming wage compensation. An analysis of 10,000 carefully observed cases⁷ has shown that the faint rate among donors who are superficially selected on history, general appearance and blood pressure reading is about 2.8 per cent. The most dangerous type of faint is that which occurs from half an hour to six hours after bleeding, when the donor is back at work or out in the street. There can be little doubt that after four years of war the average hemoglobin level of the population is lower than before the war; the number of potential donors rejected is now much greater than in 1939-1941.

STATISTICS

The accompanying table gives some idea of the exports of the service since the beginning of the war; it is by no means complete and contains only main items.

7. Poles, F. C., and Boycott, M.: *Lancet* 2: 531, 1942.

UTILIZATION OVERSEAS

The records of the amount of transfusion work carried out overseas are necessarily incomplete, but sufficient statistical evidence is now available to show on what scale transfusion supplies should be provided. The following facts give this information:

Dunkirk Campaign.—The records obtained from surviving members of The Army Transfusion Service showed that some 400 pints of blood⁸ were used during the short Dunkirk campaign; this blood had been supplied by air from the home depot.

Middle East.—An analysis of 11,732 admissions for wounding (not total casualties) in the battles from El Alamein to Enfidaville has shown that 1,119, approximately 10 per cent, required transfusion with 2.9 pints of protein fluid (blood or plasma) per case. This is the overall figure. But when wounded are selected by reason of severity, as at an advanced surgical center, the proportion requiring transfusion is almost double, and likewise the amount of protein fluid per case; here too a higher proportion of blood is required.

In North Africa almost similar figures have been obtained. There, of 16,674 admissions for wounding, 10 per cent required transfusing with 3 pints of protein fluid, and here again, at selected centers, where severe casualties are admitted, the rate rises to as high as 25 per cent.

All surgeons with active service experience have found it necessary to have a proportion of blood available with which to supplement their ample supplies of plasma. This is required especially for abdominal cases, for those who have to receive a massive transfusion exceeding 4 to 5 pints of protein fluid, for those who have been resuscitated in a forward area and have subsequently deteriorated again during evacuation, for septic patients and, with advantage, for any transfusion required during operation or as a postoperative measure. In general terms, if protein fluid is supplied on an overall basis of 3 pints per 10 per cent of casualties in the proportion of 1 pint of blood to 2 of plasma, the supplies are sufficient, provided they are distributed so that selected centers receive double quotas. Between July 1940 and June 1943 the base transfusion unit of the Middle East forces provided 10,379 pints of blood obtained from base troops, while in North Africa during six months' campaign 1,094 pints was so provided.

As to crystalloid fluids the utilization appears to be on the same scale as protein fluid, namely 3 pints per 10 per cent of wounded admissions. The large consumption is accounted for almost entirely by the requirements in abdominal cases during the postoperative period when they are treated by gastric suction and hydrated by the intravenous route. Each patient may require 15 to 30 pints in the four or five days following operation.

GENERAL POLICY

The foregoing account will make it clear that the policy of the British army has been to supply transfusion fluids to the places where they are needed, complete with administration apparatus, and to train officers and men specially for this important side of war casualty work. There can be little doubt that this policy permits of very much more efficient transfusion work than that pursued by the enemy countries, who have relied on mass blood grouping of troops, from whom blood is obtained on the spot, and on synthetic blood substitutes not far in advance of the acacia saline solution of the last war and greatly inferior to natural blood plasma.

8. Maycock, W. d'A.: *Brit. M. J.* 2: 467, 1940.

Clinical Notes, Suggestions and New Instruments

SUPRAPUBIC SUCTION

THREE NEW APPLIANCES

CLARENCE G. BANDLER, M.D.; IRVING HELFERT, M.D.,
AND BERNARD D. PINCK, M.D., NEW YORK

Surgical extirpation of the prostate may be performed through three approaches: the transurethral, the perineal and the suprapubic. The oldest of these, and still a very popular procedure among urologists, is the suprapubic operation.

This procedure is carried out in either one or two stages, the first stage consisting of cystostomy for drainage, and the second stage the actual enucleation of the prostate gland. Despite the individual technical variations of the many proponents of this approach, suprapubic drainage of some type is utilized postoperatively.

When the two stage operation is selected, ordinarily a Pezzar catheter is employed for the cystostomy. After prostatectomy has been performed, either as the second stage of the two step operation or as a single procedure, hemostasis and drainage are effected by the following means:

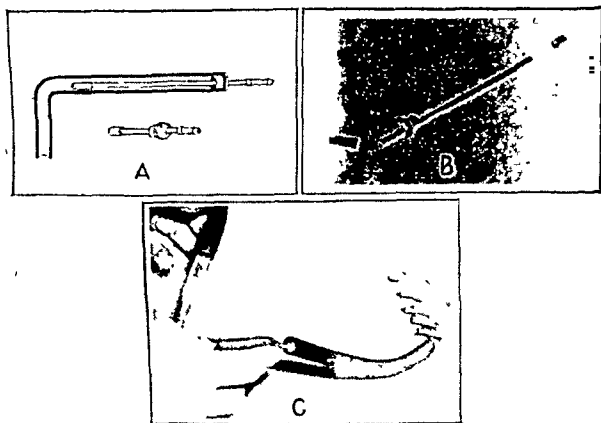


Fig. 1.—Suction piece designed primarily for Pezzar tubes: A, diagrammatic representation; B, component parts; C, applied after cystostomy.

1. Use of Pilcher or Hagner bag.
2. Packing of prostatic bed and utilization of Freyer tube for drainage.
3. Packing of bed and use of Pezzar catheter for drainage.
4. Packing of bed without additional tube drainage.
5. Tube drainage suprapubically without hemostatic device in prostatic bed.
6. Foley hemostatic bag by urethra with or without suprapubic drainage.

It is now generally recognized that some type of suction appliance facilitates the postoperative course, because wound healing is accelerated and the patient is spared the anguish of constant abdominal urinary leakage. Many urologic clinics are now utilizing several varieties of suction mechanisms. These are individual units based on either water suction, siphonage or electric motor. Regardless of the apparatus employed it is necessary in every instance to have an adequate sterile connection between the suction and the operative zone. A variety of appliances have been constructed for this purpose, but thus far objectionable features have not all been overcome. Heretofore no true mechanical device has been designed for tube drainage, most clinics employing some makeshift arrangement which does not allow adequate suction or afford sterility. Skin suction instruments of several varieties have not met requirements for ease in sterilization and maintenance of a dry wound.

From the Department of Urology, New York Post-Graduate Medical School and Hospital.

In this communication we present three new devices which will meet every drainage contingency of suprapubic procedures. The instruments may be constructed of chromium plated brass, stainless steel or transparent plastics.

Figure 1 demonstrates an easily applicable suction piece designed primarily for Pezzar tubes. The apparatus consists

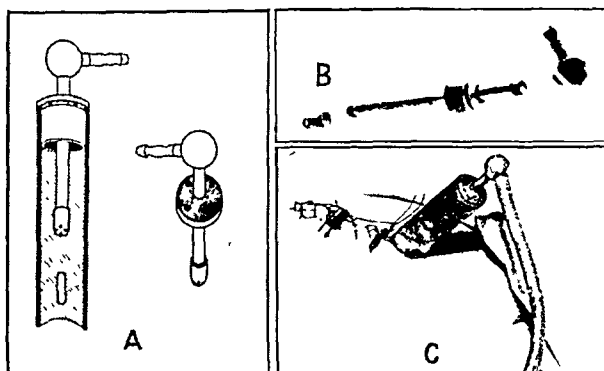


Fig. 2.—Device designed for suction through a Freyer tube; A, diagrammatic representation; B, component parts; C, applied after prostatectomy.

of three separable parts. This construction permits ease in cleaning by nurse or orderly.

Figure 2 demonstrates the second device, which has been designed for suction through a Freyer tube. This attachment is applied six hours after operation. It can be inserted with ease and provides a sterile protective cap for the open Freyer tube.

Figure 3 is the appliance employed for direct contact with the incisional area. This apparatus is used when all tube drainage has been disconnected and as long as abdominal leakage persists.

At the New York Post-Graduate Medical School and Hospital all three instruments are employed routinely for suprapubic prostatectomies. It is our feeling that certain objectionable features of previous suction connectors have been overcome. It is to be noted that the devices are applicable in a variety of other instances when tube or fistula drainage is present. Thus the implement shown in figure 3 has been successfully employed in draining duodenal and biliary fistulas.

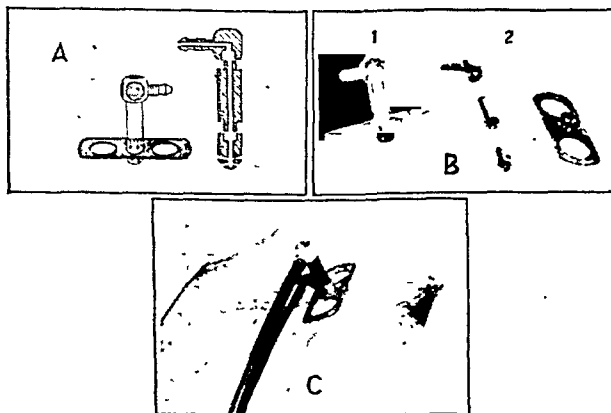


Fig. 3.—Appliance employed for direct contact with the incisional area: A, diagrammatic representation; B, component parts (1) assembled plastic sets, (2) metal instrument; C, applied directly to wound.

COMMENT

Although the three new suction attachments are designed primarily for suprapubic surgery, they may be employed in answer to other operative necessities. Separable parts allow for ease in cleaning and sterilization. It is our feeling that the advantages of suction can best be achieved wherever surgical procedure warrants the employment of these devices.

Special Article**AMERICAN HEALTH RESORTS****NATURE OF NATURAL THERAPEUTIC
AGENTS USED AT HEALTH
RESORTS****I. MINERAL WATERS**

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SARATOGA SPRINGS, N. Y.

II. PELOIDS

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These special articles on spa therapy and American health resorts were prepared under the direction of the Committee on American Health Resorts. The opinions expressed are those of the authors and do not necessarily reflect the opinion of the committee. These articles may be published later as a Handbook on Health Resorts.

A consideration of the natural resources of a health resort includes a description of the mineral waters or peloids which are found in that location. Climate, of course, is a natural resource as well. It is our purpose in this paper to discuss information regarding the nature and types of mineral waters and peloids found at health resorts. It should be stressed that the type of treatments which may be developed at a health resort will depend to a considerable degree on the nature of the mineral water or peloid available. The entire program, however, has certain common features in all places. The general aspects of treatment in health resorts will be emphasized in other papers.

The definition of a mineral water differs with the point of view of the discussor. The geologist will class all waters which come from deep in the earth's crust as mineral waters. The chemist will look to the amount, nature and type of minerals in the waters. The physician is particularly interested in the therapeutic response to the use of these waters. A simple definition from the medical standpoint would be "Mineral waters are natural waters which have therapeutic value because of their nature and constituents."

Peloid is an internationally accepted term for all types of muds, moors and peats used for therapeutic purposes. Peloids have worldwide therapeutic use for topical application in various chronic diseases, and there is a steadily increasing interest in their usage in this country. It is necessary, therefore, to include information on the different types of moors and muds which are available in various health resorts.

It is impossible to present within the scope of this paper full details regarding all types of mineral water and peloids which are found in the United States. The following discussion will therefore present in broad outline the basis on which any physician may interpret the reported analyses of mineral waters and peloids and evaluate for himself in general the indications for their use.

I. MINERAL WATERS**A. METHODS OF PRESENTING INFORMATION
REGARDING MINERAL WATERS****1. Simplified Classification Used for Teaching.¹**

There is no universally accepted outline by which the type and nature of mineral waters may be described. I have for some years in lecturing in medical schools used a simplified classification, recognizing that it is not complete. It has, however, been found to cover nearly all the possibilities and offers a general scheme for the evaluation of the mineral water of any resort.

A series of tables will give the outline as presented.

Temperature: Mineral waters may be divided on the basis of the temperature at which they come to the surface of the earth. The dividing line between non-thermal and thermal springs may be taken roughly as 15 degrees above the mean average air temperature of their location. This, of course, would vary in different parts of the United States, but for practical purposes the temperature of 70 F. is generally accepted as the dividing point. In the thermal group those above 70 F. are divided into warm or tepid springs when they are between 70 and 98 F. and hot springs when their temperatures on emerging from the earth are above 98 F.

Mineral waters may also be classified on the basis of mineral content. In the analysis, one finds various anions and cations which, when taken into the body, will produce definite effects. In table 2 a simple classification of these factors is given.

Mineralization: It will be seen that mineral waters are built up largely around the alkaline and saline anion groups. It is not common to find a purely alkaline water in this country. It is more apt to be combined with some saline material and to be placed in class C, which includes combinations of A and B. Many of the springs in this country have the sulfate anion, which generally combines with either sodium, calcium or magnesium. Also there are many waters with chlorine as the principal anion, and in some places both sulfate and chlorine are found in the same water.

For centuries, waters containing iron have been considered in a special group. In the earlier literature the term "chalybeate" is applied to these waters. In order to be classed as an iron water it should contain at least 10 mg. of ferrous or ferric iron per liter. Many waters are found which contain less than this and, while they may be therapeutically active, it is necessary to determine some point at which a water may be included in this group.

The neutral or indifferent waters are those that contain only traces or relatively small amounts of mineral constituents. In general, many of our thermal waters in this country are lightly mineralized. This does not mean that they are not of value from a therapeutic standpoint, but one cannot base the therapeutic effect on their mineral content.

Gaseous Constituents: Many mineral waters likewise contain dissolved gases, and in table 3 are listed the gases which may be found in the various waters. Of this group, from a therapeutic standpoint, carbon dioxide, hydrogen sulfide and radon must be considered

1. McClellan, W. S.: Hydrotherapy and Balneotherapy: Outline in Lectures on Physiotherapy. Department of Therapeutics, New York University Medical School; Hydrotherapy and Balneotherapy: Modern Medical Therapy in General Practice. Baltimore, Williams & Wilkins Company, 1940, vol. I, p. 415.

of importance. The other gases are either inert or are not present in sufficient quantities to produce a therapeutic effect.

Waters also differ in their physical properties, and in table 4 is given a brief outline of such characteristics which should be included in giving a well rounded picture of any mineral water.

Physical Properties: The importance of these physical properties as they influence the palatability and the therapeutic influence of the water is evident from the outline.

In making an analysis of mineral water, the constituents are determined as ions. It would be advisable to present the analysis of any mineral water on this basis. This practice is not followed in the United States, although it is commonly used in Europe. The more accepted practice is to present the hypothetical combinations of these ions as calculated from their individual determinations. In table 5 are presented both the ionic analysis and the hypothetical combina-

TABLE 1.—Temperature

A. Nonthermal.....	Below 70 F. (21 C.)
B. Thermal.....	Above 70 F. (21 C.)
1. Tepid.....	70-98 F. (21-37 C.)
2. Hot.....	Over 98 F. (37 C.)

TABLE 2.—Mineralization

	Anions (Neg.)	Cations (Pos.)
A. Alkaline.....	HCO ₃ CO ₃ }	(Na, K, Ca Mg, Ba, Fe
B. Saline.....	SO ₄ Cl	Na, Ca, Mg Na, K, Ca, Mg, NH ₄ , Li
C. Combinations of A and B		
D. Iron water		
E. Neutral or indifferent		

tions of the Hathorn No. 2 Spring at Saratoga Spa, which may be taken as a sample form in which any analysis may be reported.

Analysis of Hathorn No. 2: The physician has in the past felt a sense of confusion when presented with the detailed ion analysis and has tended to rely on the hypothetical combinations for his interpretation of the influence of a mineral water. This approach is changing, as the younger physicians are now well trained in their courses of biologic chemistry to interpret and analyze the effects of ions in the human body. We do not think today so much of the effect of sodium chloride as a salt in the body as we do of the influence of its individual constituents sodium and chlorine. With an increasing fund of knowledge regarding the effects of these individual mineral ions in the body, the use of the ion analyses for presenting data regarding mineral waters will become more common.

It is also possible to present this information in graphic charts. They, however, do not lend themselves well to showing the amount of minerals which are present in small quantities. The graph will emphasize more particularly the major constituents, while those which are present only in traces or minimal amounts cannot be clearly shown to scale.

I have found the foregoing outline to be of real value in presenting information regarding the mineral waters to medical students and other medical groups.

2. *Mineral Waters as Discussed by W. S. Collins.*²—In reporting information regarding mineral waters, Dr. Collins has followed a somewhat different form. He has discussed the relation of ground and surface waters and included the concentrated chloride and sulfate

TABLE 3.—Gaseous Constituents

A. Oxygen
B. Carbon dioxide
D. Hydrogen sulfide
D. Nitrogen
E. Radon (radium emanations)
F. Combinations of two or more gases
G. Nongaseous

TABLE 4.—Physical Properties

A. Color
B. Odor
C. Taste
D. Texture
E. Gravity (tonicity)
F. Supersaturation (CO ₂)
G. Temperature

brines found in the various parts of the country. Among waters with minor constituents he considers sulfur waters as those containing hydrogen sulfide, alum waters based on their aluminum content, chalybeate waters, the bromide and iodide waters, arsenic waters, lithia waters and radioactive waters. This outline, however, does not give any framework by which a general picture can be developed.

3. *The Register of Spas and Mineral Waters Prepared by the Standard Measurements Convention of the International Society of Medical Hydrology.*³—About

TABLE 5.—Analysis of Hathorn No. 2

(Results in parts per million or milligrams per liter)

Ions and Radicals		Hypothetical Combinations	
SiO ₂ (Silica).....	12.4	Ammonium chloride....	49.0
SO ₄	None	Lithium chloride.....	44.0
HCO ₃	4602.6	Potassium chloride....	862.5
NO ₃	Trace	Sodium chloride.....	7015.4
NO ₂	Trace	Potassium bromide....	45.9
FO ₃	None	Potassium iodide.....	3.5
BO ₃	Trace	Sodium sulfate.....	None
Cl.....	5098.8	Sodium metaborate....	Trace
Br.....	30.8	Sodium nitrate.....	Trace
I (Iodine).....	2.7	Sodium nitrite.....	Trace
Fe (Iron).....	6.9	Sodium bicarbonate....	651.1
Al.....	1.8	Calcium bicarbonate....	3230.6
Mn.....	Trace	Barium bicarbonate....	52.8
Ca.....	799.0	Strontium bicarbonate..	Trace
Ba.....	28.0	Ferrous bicarbonate....	18.7
Sr.....	Trace	Magnesium bicarbonate	1901.6
Mg.....	331.0	Alumina.....	3.4
K.....	465.2	Silica.....	12.4
Na (Sodium).....	3174.4		
Li (Lithium).....	7.2		
NH ₄ (Ammonium).....	16.5		
O to form Al ₂ O ₃	1.6		
Total.....	14,580.9		11,580.9
Titratable alkalinity = 3,640 p. p. m. CaCO ₃			
Titratable chlorinity = 5,090 p. p. m. Cl			
Temperature 10.3 C. at spring			
Free carbon dioxide in solution at spring temperature and mean atmospheric pressure (cc. per liter).....			
1,230 cc.			

fifteen years ago an effort was made to unify the methods of reporting information regarding spas and mineral waters. This was made under the direction of the Committee of the International Society of Medical

2. Collins, W. S.: *Mineral Waters: Their Composition*, *Cyclopedia of Medicine*, ed. 1, Philadelphia, F. A. Davis Company, vol 8, p. 965.

3. *Register of Spas and Mineral Waters Found in . . . Land*, prepared in accordance with the International Standard Measurements Convention of International Society of Medical Hydrology, 1929, specimen copy.

Hydrology, whose membership includes workers in practically all countries where mineral waters are utilized in the treatment of disease. After considerable study, the committee made definite recommendations for the establishment of a Register of Spas and Mineral Waters in any country. They recommended that the material be presented in the language of the country but that the classification of details regarding the nature of the waters and the facilities of the spa should follow a common outline.

The report of this committee was presented in a pamphlet of twenty pages published by the International Society of Medical Hydrology. The outlines presented are without question complete but in some factors extend beyond what would appear necessary for the practical interpretation of any mineral water. The classification of the waters as recommended by this committee is given under the three headings (a) chemical characteristics, (b) physical characteristics and (c) medicinal characteristics.

(a) Chemical: In describing the chemical characteristics of the water it recommends the standard analysis by ions, which it suggests should always be presented as milligrams per liter or milligrams per kilogram of the water. Technically it is correct to express them only as milligrams per kilogram, but in mineral waters the liter is the more common measure in use when the physician prescribes the waters. The values in each case differ only slightly, not enough to produce significant errors of interpretation. The committee recommends in addition to the presentation of the chemical data outlined the determination of the concentration ratio, which is obtained by comparing the different constituents with the dominant ion present. In the recommendation of the committee, the dominant ion or the one present in the largest quantity is given a value of 100. Then the concentration factor of this constituent is determined by dividing the milligrams per liter by 100. The concentration of each ion divided by the concentration factor gives its concentration ratio. To the best of my knowledge this interpretation has not been included in any of the work dealing with the springs of the United States, and I am not familiar with its general use abroad.

TABLE 6.—Chemical Grouping of Waters

1. Chloride.—Sodium chloride
2. Sulfur.—An alkaline or hydrogen sulfide
3. Sulfate.—As magnesium or sodium salt
4. Acid.—Sulfuric or hydrochloric
5. Iron.—As bicarbonate with excess of carbon dioxide, but sometimes as sulfate with acid
6. Alkaline.—Sodium bicarbonate
7. Calcium.—As carbonate with excess of carbon dioxide or as sulfate or chloride
8. Waters may also be characterized by other elements such as arsenic, lithium, magnesium, bromine and iodine
9. Waters of low concentration

In addition, the committee recommended, as was discussed in a previous section, that the analyst calculate the probable saline combinations for the different constituents found in the mineral water. It also gives directions for the probable chemical combinations, so that all reporting for the register would follow the same method in determining the hypothetical combinations of the salines present in the waters. This procedure in general is followed in the reports available in this country.

The committee also allows for the reporting of the analyses in any standard measurement recognized by the country. For instance, it is common in some coun-

tries to report the analyses as parts per hundred thousand. In general, in this country the expressions "parts per million" or "milligrams per liter" are in common use, although in many older analyses the expression "grains per gallon" is found. The latter values may be changed to the standard by multiplying with the factor 17.1.

After the determination of the chemical characteristics, the committee recommends the classification on

TABLE 7.—Physical Classification

1. Temperature (at the source)
a. Cold, below 20 C. (68 F.)
b. Subthermal, 20 to 37 C. (68 to 98 F.)
c. Thermal, 37 to 42 C. (98 to 105 F.)
d. Hyperthermal, above 42 C. (105 F.)
2. Radioactivity
a. Of the water itself or
b. Of the contained gas
3. Tonicity.—The tonicity may be expressed by the terms hypotonic, isotonic, hypertonic as determined by the influence of the water on the osmotic fluids within and without body tissues
4. Other characteristics include degree of ionization, colloidal properties and gaseous constituents

the basis of the presence of a dominant ion, as shown in table 6.

(b) Physical: The committee includes here data similar to those used by me in my teaching outlines. It presents the thermal variations in centigrade temperatures which follow closely the divisions commonly used in this country. It recommends including the data given in table 7.

More recent studies of waters have also revealed information regarding the catalytic activity, peroxidase reaction, electrical conductivity as determined by the various methods available at present, which have expanded the importance of a careful consideration of the physical characteristics of a mineral water. It is advised that these data also be included when they are available.

(c) Medicinal: The medicinal classification as presented by this committee is given in table 8. It is evident to the physician that this outline of the medical action of the water is somewhat arbitrary and would no doubt call for more complete description of the influence of the various ions on physiologic processes. These physiologic changes are implied in the table.

In addition to the extensive outline recommended by the committee for the classification of the mineral waters of a place, it also suggests that data be added regarding the climatic characteristics, the geology of the district, the nature of the source of the mineral water, the depth from which it comes, if known, the flow for twenty-four hours and the general character of the surrounding terrain. This information is helpful to the physician, because the climate and other characteristics of a location may be the final deciding factor regarding the selection of the location for his patient. It is true that the cardiac patient does not tolerate hilly country, while he may be able to walk comfortable distances on a level terrain.

As stated, this recommended outline of the International Society of Medical Hydrology is complex in character but has many admirable features. Owing to the development of World War II, the activities of the international society have been suspended for the duration because its membership contained physicians and others interested in mineral waters from practically all countries involved in the present conflict. Therefore the register of spas has not been further developed.

4. *Lehrbuch der Bäder- und Klimaheilkunde*, Edited by H. Vogt.⁴—This two volume edition contains the most complete description of mineral waters, peloids and climate and their application in the treatment of patients with conditions which are influenced by these agents that has come to my attention. Leading experts in their various fields have contributed to this work. They discuss the geology and origins of the mineral waters, the methods of spring control and the administration of these agents in treatment. Also there are complete sections dealing with the chemistry of mineral waters and peloids, as well as pharmacologic and physiologic considerations of their application. The clinical discussions cover the indications and contraindications for balneotherapeutic procedures in various medical conditions. Space does not permit a more detailed review of this excellent work, but the reader is referred to it for a most complete review of the subject.

5. *Newer Information Regarding Minerals Found in Small Quantities*.—With the advent of the spectroscope and the development of new organic compounds for the concentration of various minerals, new tools have become available which are revealing a remarkable picture of elements in the mineral waters which up to the past ten to fifteen years were considered of no importance in the body. The function of these elements is being recognized at the present time, and the newer methods for detecting their presence and quantity are adding valuable information in the field of mineral waters. The work of Strock⁵ with the spectroscope on the mineral waters of Saratoga and the development of organic reagents by Baudisch⁶ which allows for the concentration of minerals present in small quantities have given valuable information regarding the nature and content of the Saratoga waters. In another paper in this series, Baudisch⁷ has reviewed in detail the importance and practical value of these elements present in small amounts (trace elements).

B. CLINICAL APPLICATION OF MINERAL WATERS

It is of interest to consider the way in which mineral waters play their part in the therapeutic program of patients with various conditions. There are five general ways of administering mineral waters. In the first place they may be taken in the form of baths in which temperature, time and nature of constituents play a part. Secondly the mineral waters may be used for the

TABLE 8.—*Medicinal Classification*

- | |
|--------------------------|
| 1. Purgative or aperient |
| 2. Diuretic and solvent |
| 3. Alterative or tonic |
| 4. Surface action |
| a. Sedative |
| b. Stimulant |

preparation of hot packs when the factor of heat is of primary importance. Thirdly they may be utilized for gargles and also for colonic or vaginal irrigations. Again, mineral water properly nebulized by mechanical means may be inhaled, in which treatment it reaches all parts of the respiratory tree. Its influence here, of

course, may be local on the irritated membranes, or it may be general from the absorption of minerals or gases which are present in finely divided form in the vapors. Finally, and probably the most widespread method of application, is the internal use, whereby patients take varying amounts of mineral waters during a regular program of treatment at the resort or may follow their more regular use at home when the mineral waters are bottled for general distribution.

TABLE 9.—*Factors Which Determine the Effect Produced by the Use of Mineral Waters*

- | |
|--------------------------|
| A. Temperature |
| B. Gravity—mechanical |
| C. Chemical constituents |
| 1. Minerals |
| 2. Gases |
| 3. Reaction (alkaline) |
| D. Physical features |

The technic and details of the administration of the mineral waters in the ways that have been described will be given more attention in the sections of this series dealing with particular disease conditions.

Physiologic changes which are brought about in the administration of mineral waters by any of the aforementioned methods may be outlined as in table 9. Harpuder⁸ and Vogt⁴ have reported the extensive studies made in this field.

A. *Temperature*.—This is an important factor in any hydrotherapeutic procedure, whether the person is using plain water or mineral water. In general, the extremes of temperatures, either hot or cold, are stimulating and, when temperatures beyond those which can be tolerated in either extreme are used, the destruction of the tissues will occur either from burning or from freezing. The use of neutral temperatures—those which feel neither hot nor cold to the patient—will not produce any definite temperature reaction. When one wishes to produce a temperature reaction which will directly influence the circulation and nervous system, then the degree of temperature either cold or warm is specified so that the reaction can be properly controlled. It is important here as with any other therapeutic agent to evaluate the physical status of the patient to determine whether or not he will tolerate the treatment to advantage. In other words, a person who is weak, rundown and suffering from low blood pressure and exhaustion will in general not tolerate the extremes of temperature, either hot or cold, but can best be treated with hydrotherapeutic applications in the neutral range. This holds true as well for mineral water as for plain water.

B. *Mechanical Effects*.—The mechanical effects of the application of mineral waters are dependent primarily on the specific gravity of the water itself. The strong brines, when used in baths, will produce greater pressure on the surface of the body than will lightly mineralized or plain water. This mechanical factor is of greater importance than usually considered by the physician who is prescribing baths. Its pressure on the lower extremities will aid in the venous return to the larger abdominal collecting veins. It will also aid the lymph circulation. When the abdomen is under water in the bath it exerts a pressure through the abdominal wall and will continue its aid to the returning venous circulation.

4. Vogt, H.: *Lehrbuch der Bäder- und Klimaheilkunde*, parts 1 and 2, Berlin, Julius Springer, 1940.

5. Strock, L. W.: *Geochemical Data on Saratoga Mineral Waters Applied in Deducing a New Theory of Their Origin*, Am. J. Sc. **239**: 857 (Dec.) 1941.

6. Baudisch, Oskar: *The Importance of Trace Elements in Biological Activity*, Am. Scientist **31**: 211 (July) 1943.

7. Baudisch, Oskar: *The Importance of Trace Elements in Biologic Activity*, J. A. M. A. **123**: 959 (Dec. 11) 1943.

8. Harpuder, Karl: *Ergebnisse der experimentellen Balneologie*: Ergeb. d. inn. Med. u. Kinderh. **42**: 100 155, 1932.

This pressure factor may work to the disadvantage of patients with dyspnea or cardiac disability if they are given a bath covering the entire chest and shoulders. The exertion of pressure over this portion of the body reduces to some degree the normal negative pressure developed in the pleural cavities during inspiration. This negative pressure is one factor which aids the satisfactory filling of the right heart. When it is diminished it may produce some difficulty in this filling and in patients who have a limited cardiac reserve it may produce definite symptoms. It is therefore customary for patients with these conditions to have the bath only to the lower border of the chest or, at most, to the middle of the chest.

The mechanical factor as expressed in the gravity or the concentration of the mineral waters is also important when they are used internally. Here they are usually described as either hypertonic, isotonic or hypotonic, dependent on the relation of their saline concentration to that found in blood serum. It is well known that mineral waters which are hypertonic will act in a manner similar to any hypertonic saline solution. They will cause a withdrawal of fluids from the body into the intestinal tract and result in more rapid and complete elimination of materials from the intestinal tract. If the mineral water is isotonic it will produce little, if any, fluid shift. If the water is hypotonic it will be more rapidly absorbed from the intestinal tract and generally result in increased elimination through the kidney. These general principles may be influenced somewhat by the nature of the chemical constituents in the mineral waters, but for the most part mineral waters will act according to the physical principles of any solution.

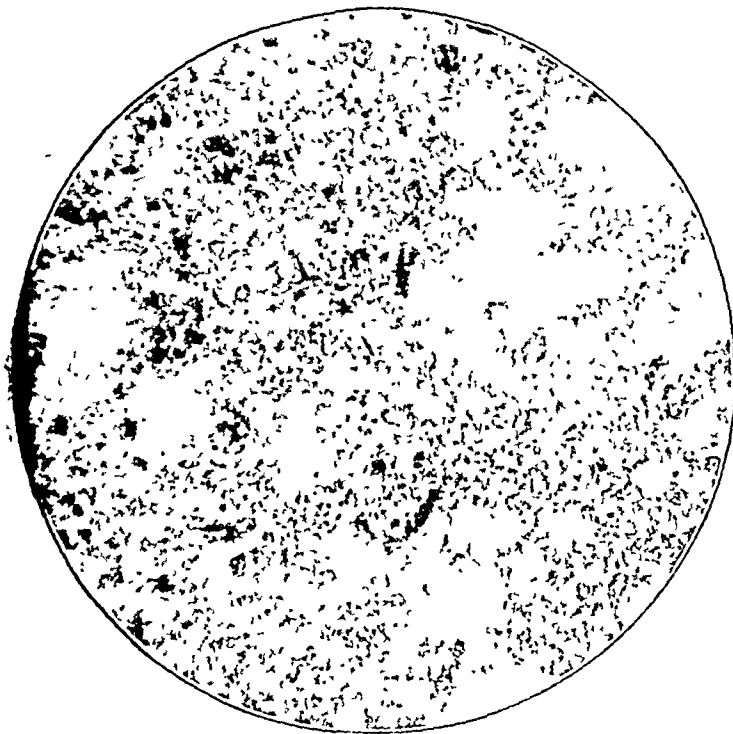


Fig. 1.—Mineral mud, conditioned by drying and milling, ready for therapeutic use. This and the accompanying photomicrographs are of some of the American peloids collected on a roving six months survey in the United States.

C. Chemical Constituents.—A consideration of the chemical constituents of mineral waters and their influence on physiologic processes would of course entail too great a discussion for the scope of this paper. When one considers the variety of minerals found in the various mineral waters, as well as the gases which are present, one can realize the multiple influences which

they will produce in and on the body. The influence of mineral waters used in bathing will be determined in part by the nature of the gases present. In general, gases in solution, such as carbon dioxide, hydrogen sulfide and radon, will be absorbed through the skin

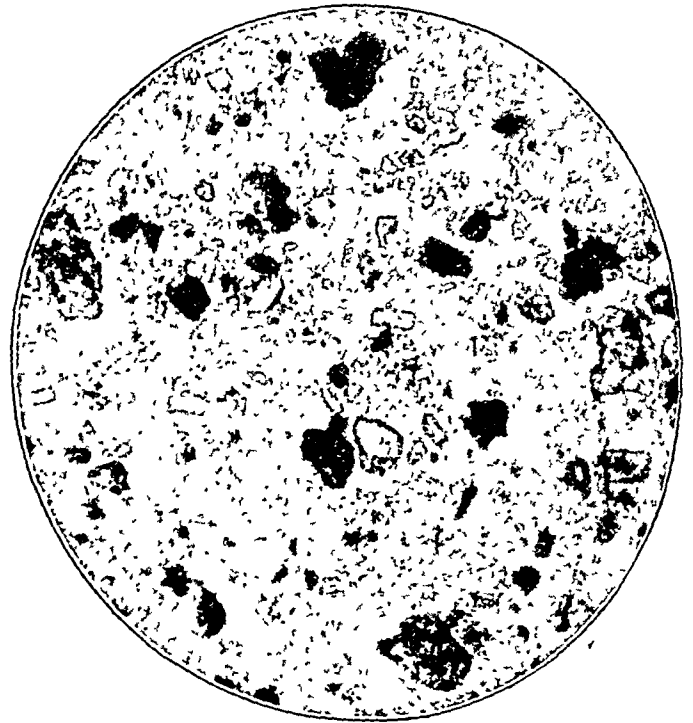


Fig. 2.—Sea mud or liman consisting of microscopic shells and detritus of seaweeds.

from the bath and produce effects internally. The absorption of other substances in solution from the baths has received considerable attention. There is some evidence that the halogens, particularly iodine and bromine, will be absorbed and also that substances like boron will pass from water containing them through the skin during a bath. The extent of this absorption and factors controlling its rate still require extensive study before definite statements can be made in this field.

When waters are taken internally, the dissolved or ionized minerals present are taken into the intestinal tract. Their absorption from the intestinal tract will be controlled by the general principles applicable to these various minerals when they are taken in any form. Certain minerals will form insoluble compounds in the intestinal tract and therefore are not readily absorbed. Others will remain more freely ionized and will be taken into the body more readily. The fact that practically all mineral elements found in the human body are present in some mineral waters indicates that many of the waters can be used to provide these elements when for any reason there is a mineral deficiency in the body. The physiologic studies of elements found in small amounts are still in their infancy, but the careful study of mineral waters is bringing forth information that the waters may be a source of some of these trace elements when they are not found in sufficient quantities in a person's diet.

In addition, the hydrogen ion concentration of the mineral water will indicate the extent of the free acid or alkaline ions. The presence of bicarbonate or carbonate salts in mineral waters will many times produce a considerable shifting in the acid base balance, so the mineral waters should be prescribed and taken with a knowledge of the shifts which occur.

The physical features of mineral waters which play their part in the therapeutic effect have been covered in the foregoing outline. Temperature, gravity or tonicity and the presence of carbon dioxide have been considered. The other physical properties influence more particularly the palatability of the water and indirectly, therefore, will determine to some extent the quantity which an individual patient may take. The fact that a water may be palatable to the taste, however, is no guaranty that one should take a greater amount of that water than some other. However, it does influence the amount of water which may be taken. Other physical factors play a minor role in the therapeutic result.

II. PELOIDS

Peloid is a generic name for substances which originate in nature by geologic process and which after certain methods of artificial processing can be applied as baths and packs in medical practice.

HISTORY

The medical use of muds and moors is ancient but not antiquated. Their use can be found depicted in mementoes of Assyrian, Babylonian and Persian medicoreligious ceremonies, and it is well known from old Latin scripts that aristocratic rheumatic Romans used the heated sea-mud extensively in the palatial bath houses of ancient Rome (150 A. D.).

More than three hundred European spas were applying pelotherapy in 1935, especially in Czechoslovakia, England, Italy, France, Germany, Hungary, Norway, Russia, Rumania and Sweden.

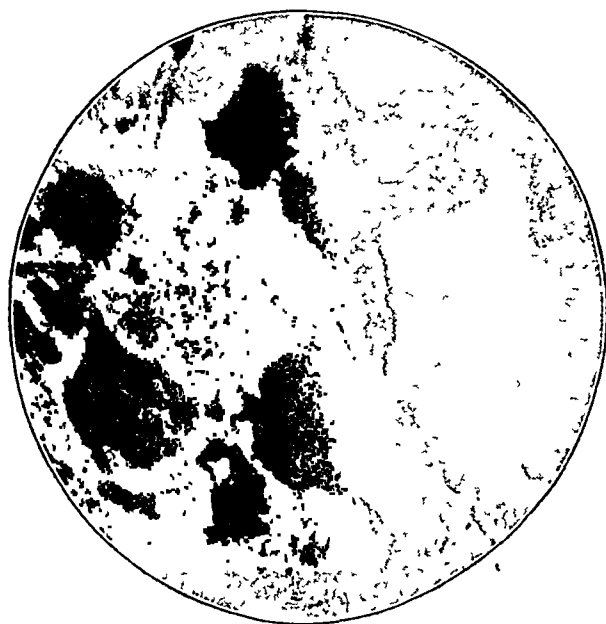


Fig. 3—California moor characterized by coarse debris of vascular plants

To underscore the prestige pelotherapy enjoys in Europe, it is worthy of mention that in the early 1930's a state committee was founded by the Austrian government to register and analyze the Austrian muds. The places which they registered became state reservations.

The International Society of Medical Hydrology appointed a special committee for classifying, subdivid-

ing and nominating the different types of mud. The generic name "peloids" was agreed on by this committee under the chairmanship of Dr. S. Judd Lewis of England. Its classification of peloids, while highly scientific from the point of view of a geologist or a

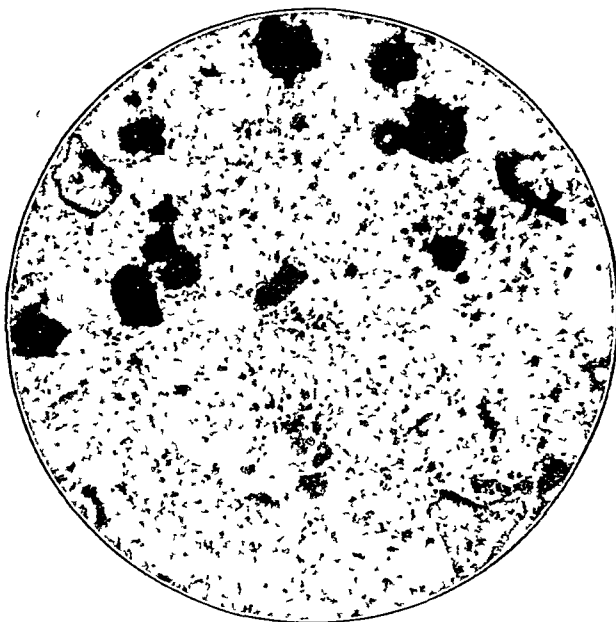


Fig. 4—Mixed lake peat from Florida containing carbonized plant detritus and diatomaceae.

botanist, is too complicated even for specialists of medical hydrology. My recommendation in 1932 to this international committee was a simple one and is based on the diminishing silicate content of the manifold peloids. It is as follows:

PELOID TYPES

1. Purely mineral (fango, mud).
2. Mainly mineral (sea mud or liman).
3. Mainly vegetable peloid (moor, peat).

1. Fango is a homogeneous, fine grained, nearly pulverized mud, collected from beds of mineral springs of volcanic origin (Italy, Rocky Mountains).⁹

2. Sea mud, or liman, is a mainly mineral mud, deposited on the bottom of shallow bays and inlets, containing microscopic shells of diatomea, fusillaria and spongilla needles, all of them cadavers of the "one cell life" of the ocean, mixed with quartz, sand and detritus of sea vegetation (New York, New Jersey, Sweden, Russia).¹⁰

3. Moors or peats, mainly vegetable muds, are the end products of an anaerobic humid moldering of marsh vegetation.¹¹ This process brings about the formation of organic acids, as formic, acetic, humic and resinous acids, in the ever growing and ripening marshy layers. Peat is characterized by its carbonized content of plant particles found in bogs (Germany, Florida, South California).

9 Behrend, H. J.: Fango Packs in Therapy, Arch. Phys. Therapy 17: 501, 1936. Vrtak, E.; Benson, S.; Kobak, D., and Carlson, A. J.: Fango Treatment of Arthritis, Arch. Phys. Therapy 19: 525, 267, 1938.

10 Schazillo: Der Einfluss der Limanbehandlung, Ztschr. f. phys. Therap. 33: 67, 1927.

11 Engelmann: Sole oder Moorbäder bei Frauenkrankheiten, Zentr. f. Gynak. 21, 1932. Vogt, H.: Grundsätzliches zur Moor- und Schlammbehandlung, Deutsche med. Wchnschr. 60: 96 (Nr. 19) 1934.

PELOID CHARACTERISTICS

1. *Chemical Properties.*—The main bulk of mud is made up of sand, clay and kaolin; that of moors and peats of diatomaceae, algae, mosses and the debris of vascular plants; sea muds contain a mixture of mineral and botanical constituents. Chemical analysis of water soluble, ether soluble and hydrochloric acid soluble ingredients displays the presence of the following ions, characteristic of muds: Si, Na, Ca, Fe, Cl, I, C, SO₄, SH. It also contains in minor quantity the following ions: Li, Mg, Mn, Al, Br. The organic components in limans, moors and peats consist of cellulose, humic acids, fats, waxes, tars, resins and estrogenic substances.

The reaction of muds is neutral.

The reaction of liman is alkaline.

The reaction of peats and moors is acid.

2. *Physical Properties.*—(a) High specific gravity. (b) Low specific heat. (c) Low heat conductivity (high heat retentivity). (d) Homogeneous dispersion of particles. (e) High plasticity, due to dispersion and colloids. (f) Radioactivity (volcanic muds).

MODES OF USE

The application of the so-called pelotherapy consists of:

1. *Baths.*—(a) In specially built bathtubs. (b) In mud pools—natural and artificial.

2. *Packs with Heated Mud.*—Mud baths are given extensively in European health resorts. Whereas both mud pools and mud tubs are practicable only near the finding place of the mud or in specially built institutions, mud packs can be given at any place, as the dry mud is easily transported.

To prepare a mud pack, the dry mud has to be mixed with about an equal amount of water and heated to about 60 C. It should cool down to about 45 C. and have the consistency of butter. The mud pack should be administered on a massage table or cot provided with a heavy woolen blanket, a rubber sheet and a coarse linen sheet, to be spread on the cot in the order named. The parts to be treated, often several joints or whole limbs, should be thickly covered with the hot mud, spread partly on the coarse linen, partly on the treated parts. Sheets and cover should be quickly wrapped around the body to prevent loss of heat. The patient remains one-half to one hour in the pack, which is followed by a cleansing bath and an hour's rest.

BIOLOGIC EFFECTS

The biologic effects of mud treatment are mainly due to its physical properties.

As the specific heat of the mud is much lower than that of the water, a temperature of even 50 C. can be well borne in hot mud (in plain water only about 44 C.).

Owing to poor heat conductivity, mud packs grow only slightly cooler during the generally protracted application. The number of calories transmitted per minute is lower than in water. Water of 33 C. feels indifferent to the skin. The mud packs feel indifferent at 38 C. The heat of the mud does not invade the skin vehemently but "sneaks" in (einschleichen).¹²

Important counterirritation of the skin is caused by the mechanical stimulation of the quartz grains, microscopic spicules, needles and shells. The plasticity of the mud enables it to be applied to any part of the body,

giving a complete heat isolation to the treated parts. All these properties of the heated mud cause an extreme and deep passive hyperemia.

A considerable increase of the skin temperatures can be witnessed, as the result of stagnation in the venules. While the capillaries are opened and congested by this passive hyperemia caused by the heat, the pressure exerted by the heavy mud simultaneously compresses the lymph spaces and lymph vessels, evacuating their contents.

These skin effects elicit deep-seated changes: (1) increase of body temperature, (2) lowering of blood pressure and (3) influence on mineral metabolism and blood chemistry.¹³

The mud pack is a very effective form of conductive heat therapy, having an anodyne, absorption promoting decongestive effect.

INDICATIONS

The use of mud packs is mainly indicated in the local treatment of (1) chronic arthritis, irrespective of cause, (2) fibrositis, (3) neuritis, sciatic syndrome, (4) after-treatment of fractures and (5) sport and industrial injuries.

CONTRAINDICATIONS

1. Acute diseases and subacute stages of chronic diseases.
2. General physical debility and early convalescence.
3. Late stages of tuberculosis.
4. Severe peripheral vascular diseases.
5. Cardiac decompensation.
6. Gravidity.

COMMENT

An advantage of the mud treatments over electric treatments is that large surfaces, several joints, can be treated at one time, the pliable mud evenly surrounding whole limbs; an advantage over hot water baths is the higher point of indifference, which enables the patient to endure temperatures above 50 C. in the mud without paradoxical vasomotor reactions. The patient and his family can be taught to apply the heated mud in the home and so reinforce the efficiency of the usual office treatments in the aforementioned chronic disorders.

In my European Physical Therapy Institution, built above a mineral well, there was a tiled mud pool, 12 by 12 feet in dimension. The 3 foot deep mud on the bottom of it was transported in barrels from Pistany, Czechoslovakia, and Kolop, Hungary. It was heated to 90 C. with high pressure steam blown into the mass of mud through eight pipes from all directions before use. Tepid mineral water, 30 C., was used for the preparation of the mud bath in this pool. In this steam driven whirlpool bath of mud, where the floating mud particles slowly gave up temperature to the water, which gradually warmed up to 40 to 42 C., there was a strongly but pleasantly felt contrast effect between the initial tepidity of the water and the stinging heat sensation of the floating minute mineral mud particles. Used as preheating for high temperature mud packs and in the treatment of fibrositis, in which it worked as a low grade fever therapy, the mud pool was a very popular modality of treatment. Rectal temperatures of 103 F. were easily and pleasantly reached in thirty minutes in

12. Singer, C. I.: Effective European Methods of Hydrotherapy Neglected in United States, Arch. Phys. Therapy 17: 631, 1936.

13. Bernstein: Ueber die Wirkung der Schlammtherapie auf die biochemischen Eigenschaften des Blutes, Ztschr. f. phys. Therap. 31: 93, 1926. Brusilovski and Rubinstein: Das Blutbild nach Schilling bei Arthritiden unter dem Einfluss der Schlammbehandlung, Ztschr. f. klin. Med. 107: 507, 1928.

this pool. The State Workers Insurance Fund had a contract with the institution through the Hungarian State Department of Labor for the treatment of its insured workers, disabled by chronic sickness or accident. The State Insurance Fund stated that its computed outlay for therapy and compensation in the rheumatic group of diseases diminished 23 per cent through two years' use of pelotherapy among the insured. This saving was achieved through shortened periods of disability among the workers.

To pass the expert's scrutiny as a medically useful peloid, the following is the list of some of the essential criteria:

1. It should be found in huge quantities.
2. It should be free of human contamination and pathogenic micro-organisms.
3. It should have uniformity of the material through the entire mud mine.
4. It should have a high degree of plasticity without adhesive properties (no stickiness).
5. It should offer an innate ease of processing.
6. It should be of low cost.

GENERAL CONSIDERATIONS

There is a vast array of chronic human ills of complex causation not amenable to surgery, resistant to routine medical curative efforts. The origin of these chronic ills is a puzzling, individual cross-web pattern of hereditary, habitual, environmental, emotional, social and occupational factors. Successively, coincidentally interwoven in these patterns of factors which determine the patient's physical welfare and longevity are the ravages done by infections, extreme and prolonged efforts and exposures of a lifetime. The organs of circulation, digestion and locomotion are the most vulnerable targets of these manifold exposures. While generally felt, it is not a crystal clear knowledge of the profession at large that the early appearance of these chronic degenerative and inflammatory processes could be prevented and that, if they occur, their medical handling requires the same long range planning as that of tuberculosis or syphilis. In this long range planning of the therapy of chronic diseases the spa regimen with its scientifically planned and medically supervised vacationing of four to six weeks' duration, involving a climatic change, a strict regulation of the diet and activities, and judicious use of the natural therapeutic agents, has a definite role for which there is no substitute.

Rehabilitation.—In periods of commercial stimulation, psychotic and psychoneurotic patients have found placement in industry in greater ratio than at other times. There is no question but that there are thousands of such individuals in mental hospitals who could be economically rehabilitated were they provided more adequate opportunities for employment. In the average mental hospital, many patients reach the point at which they could work satisfactorily in an environment in which there are provided a minimum amount of encouragement, direction and supervision. The gap between leaving the protective atmosphere of the hospital and the harsh realities of the outside job situation is too wide. The new environment, the new readjustments, competitive situations, the increased tempo of activity may produce a regressive desire to retreat from an insecure situation and return to the hospital. On the other hand, some hospital systems provide "boarding out" arrangements through which the patient lives in private families and gradually readjusts himself to the demands of work and society.—Davis, John E.: *Principles and Practice of Rehabilitation*, New York, A. S. Barnes & Co., Inc., 1943.

Council on Pharmacy and Chemistry

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING STATEMENT.
AUSTIN E. SMITH, M.D., Secretary.

THE COUNCIL ON PHARMACY AND CHEMISTRY

MEMBERSHIP, ACTIVITIES, METHOD OF OPERATION, ATTAINMENTS

AUSTIN E. SMITH, M.D.,
CHICAGO

During these days of proposed revision, increasing enforcements by administrative bodies and other restrictions which seem to be a sign of the times, it is refreshing to observe how a body with no legal power can create changes with far reaching effects. In the past thirty-nine years there has been no single body which has created as much change in the practice of therapeutics as has the Council on Pharmacy and Chemistry. The Council was organized in 1905 to serve the medical profession and the public by providing accurate information on the status of agents used in the treatment of disease. Since that time its activities have grown, and as it enters its fortieth year in 1944 the members can look back with satisfaction on the service that has been provided. Even though the Council is an integral part of the American medical profession, many members profess confusion regarding Council makeup and activities. It is to dispel some of this confusion that this paper is offered.

MEMBERSHIP

The Council consists of seventeen outstanding scientists, each associated with some recognized medical center, and a Secretary who is a full time employee of the American Medical Association with an office in Chicago. The members are David P. Barr, professor of medicine, Cornell University Medical College; J. Howard Brown, associate professor of bacteriology, Johns Hopkins University School of Medicine; S. W. Clausen, professor of pediatrics, University of Rochester School of Medicine and Dentistry; Harold N. Cole, clinical professor of dermatology and syphilology, Western Reserve University School of Medicine; Morris Fishbein, Editor of *THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION*; E. M. K. Geiling, professor of pharmacology, University of Chicago School of Medicine; Robert P. Herwick, chief, Drug Division, U. S. Food and Drug Administration; Chester S. Keefer, Wade professor of medicine, Boston University School of Medicine; Eugene M. Landis, professor of physiology, Harvard Medical School; James P. Leake, medical director, Epidemiological Section, National Institute of Health; George W. McCoy, professor of preventive medicine and public health, Louisiana State University School of Medicine; Perrin H. Long, professor of preventive medicine, Johns Hopkins University School of Medicine; Stuart Mudd, professor of bacteriology, University of Pennsylvania School of Medicine; E. M. Nelson, chief, Vitamin Division, U. S. Food and Drug Administration; W. W. Palmer, Bard professor of medicine, Columbia University College of Physicians and Surgeons; Elmer L. Sevringhaus, professor of medicine, University of Wis-

consin Medical School, and Torald Sollmann, professor of pharmacology and dean, Western Reserve University School of Medicine. Many others will be remembered for their long association with Council activities and scientific contributions. Since the Council's organization on Feb. 11, 1905 there have been appointed sixty members. The average tenure of membership has been eleven years.

The members of the Council serve without remuneration but freely give a large amount of their time and effort to the Council's work. This work cannot be estimated purely in terms of hours per week, as every afternoon or evening sacrificed by a Council member for consideration of some Council problem means the loss of that time for some other urgent problem which may relate to his family or the institution with which he is connected.

The Council on Pharmacy and Chemistry has served as a model for the Council on Physical Therapy and the Council on Foods and Nutrition of the American Medical Association and for the Council on Dental Therapeutics of the American Dental Association. There is at the moment no successful counterpart outside the United States, although representatives from several countries recently have visited the Council office to learn the details of Council functioning so that similar bodies can be established in these other countries when the time seems propitious.

ACTIVITIES

In addition to considering proprietary drugs the Council reviews the status of other agents which the medical profession, and even the public, may be urged to use, publishes reports on claimed advances in the use of medicinal preparations, with the Chemical Laboratory elaborates standards on drugs introduced into *materia medica*, provides information for physicians, members of the armed forces and others, sponsors the publication of several books and numerous research projects, and maintains a cooperative relationship with many governmental and nonofficial organizations. Its information and advice are frequently sought; it is often invited to participate in cooperative projects with other agencies. It does not hesitate to initiate an investigation when a grievous error occurs in the manufacturing and dispensing of drugs; a few such instances are well known to all. The Council also maintains cooperative relationships with many countries other than the United States, and much correspondence is exchanged on problems of mutual interest.

The publications sponsored by the Council include *New and Nonofficial Remedies*, *Useful Drugs*, *Epitome of the U. S. Pharmacopeia and National Formulary*, *Annual Reprint of the Reports of the Council*, and *Glandular Physiology and Therapy*. It also supervises the preparation of the *Intern's Manual*. By the end of 1943 well over 400,000 copies of Council publications had been distributed over the last twenty year period. Of this number *New and Nonofficial Remedies* comprised about 260,000 copies.

The Council has assumed ever increasing importance in the field of medicine until now it is truly considered one of the leading authorities on rational therapeutics. There are few who are not familiar with the Council's seal, and yet there are many who have only the vaguest conception of how this seal is issued.

PROCEDURE FOR ACCEPTANCE

The use of the seal is restricted to those products which have been found acceptable for inclusion in *New and Nonofficial Remedies*, a yearly publication of the Council. The Council considers articles for listing in this book according to a set of rules which permit consistent and fair application for all firms and their products. The rules essentially provide that an accurate statement of composition must be provided; suitable tests must be available for identification; the article cannot be advertised either directly or indirectly to the public unless it is one of those agents information on which the Council feels may be made available to the public (for example, first aid measures, laxatives, vitamins); statements regarding origin and source of raw material must not be misleading; therapeutic claims shall not be exaggerated or misleading; the label must list the active substances; the name under which the product is sold shall not be misleading or suggestive of diseases or therapeutic indications; patent numbers and trademarks, if any, must be furnished, and the preparation must not be unscientific.

Obviously it is the right and duty of the physician to know the essential composition of the drugs he prescribes. He also wishes to know if the mixtures are unnecessarily complex, being mindful of the fallacy of prescribing unnecessary potent agents and prescribing routinely several drugs of different actions in fixed proportions in one preparation. The physician also is justified in demanding that the claims offered on behalf of a product which he is urged to use should be in line with demonstrable facts. The value of such rules is self evident. When the Council insists that manufacturers keep their advertising material within the limits prescribed by Council rules, it serves to protect the public and the physician.

Some manufacturers more interested in self gain than in the welfare of the public or the physician formerly used the doctor as a means of promoting their medicine to the public. The technic was simple: Promoters were convinced that the easiest way to establish a demand for their goods on the part of the public was to make available a catchy name, especially if it was suggestive of a disease or treatment, and advertising material which could be read by the curious patient and his friends and relatives. The late Dr. Simmons referred on more than one occasion to an article on proprietary medicines which was published in an advertising journal; this read in part "But the patent medicine of the future is the one that will be advertised only to doctors. Some of the most profitable remedies of the present time are of this class. They are called proprietary medicines. The general public never hears of them through the daily press, for their publicity is secured through the medical press by means of the manufacturer's literature." This statement appeared in print almost forty years ago, and yet it is still admirably descriptive of some present day promotional practices.

PROPRIETARY NAMES

The profits to be made by a pharmaceutical house from the sale of a drug which is offered under an official name usually is quite moderate. The profits to be made from the sale of the same drug sold under a proprietary name is frequently enormous. For example, a survey in the September 1941 issue of a popular price list of drugs revealed that the total cost of an ounce of each of nineteen substances under a protective name was \$48.67, whereas the total cost of an ounce of each

of these substances under a nonprotected name was \$15.67; thus, the cost of a proprietary name to the consumer would be \$33. This represents retail price, the material being reduced to terms of ounces for convenience. Included in these nineteen agents were sedatives, vasoconstrictors, local anesthetics, anti-infective agents and analgesics. Some years ago a large hospital in an eastern city adopted a set of specific regulations which, in effect, did away with the expense of prescribing proprietary agents when official counterparts were available, and unnecessarily complex mixtures and the absurd practice of prescribing names instead of therapeutically active agents. This pharmacy within one year effected a saving of \$50,000. Thus the manufacturer frequently considers it of prime importance that his product be endowed with his own protective name.

With the desire of encouraging the introduction of drugs that are an advance over those previously known, the Council does not offer objection to the application of a proprietary, exclusive name, provided the drug to which it is applied really presents something new. Thus the Council recognizes such names for products not previously known, for substances previously known but not used in medicine, for unique and worth while variations for making this drug available, and when a known substance is found to have new value, even if that substance was used in the practice of therapeutics at an earlier date. Obviously the new value has to be worth while. If a manufacturer will read the Council rules, he will know if his new product merits recognition under a proprietary name and if the chosen name is acceptable. However, he frequently spends several years promoting the agent without regard for the rules and then feels offended if the Council will not accept the agent under the proprietary name. How simple it would be if the manufacturer would place the name before the Council when the product is ready for the market (and even before it is ready for the market) and ask the Council to consider its acceptability in the event the product is submitted to the Council for inclusion in N. N. R. If any changes are necessary they can be made easily at the time of this preliminary consideration with no inconvenience or expense for the manufacturer. The present trend is to do this.

One of the greatest evils of the use of protected names lies in the confusion they create. The old story of methenamine being prescribed in one prescription under six different names is a standing joke in materia medica classes, and yet other examples just as questionable are evident in everyday practice. In the United States the practice among the better pharmaceutical drug manufacturers seems to be decreasing, partly because these organizations are acquiring critical medical and other technical personnel and partly because experience shows a certain amount of resentment on the part of the medical profession; there is a greater tendency to reserve proprietary and protected names for specialties of the house rather than for official agents. However, there is still room for much improvement.

It is interesting to observe the nomenclature situation in an allied country, England. There, sulfanilamide is offered under fifty odd names, including Antistrept, Astreptine, Bacterimide, Bactericide, Cepticide, Erysipitan, F1162, PABS, Septinal, Streptamide, Streptosol and Therapol. Can any one hope to memorize fifty such names, none of them chemically descriptive, for one agent? Sulfapyridine is sold or prescribed under nine different names, sulfathiazole

under seven. Even the *Lancet*, an English publication which must depend a great deal on advertising for financial security, presented an editorial in August 1943 entitled "Babel in the Drug Trade." This editorial reads, in part, "It is questionable whether the British drug trade in its present form makes the most of its great opportunities for public service. The war has revealed unexpected deficiencies. . . particularly disappointing is the attitude of parts of the trade towards the canons of ethical nomenclature . . . the Council on Pharmacy and Chemistry of the American Medical Association very rightly refuses to recognize proprietary names for articles which are included in their Pharmacopeia and National Formulary. In the marketing of original articles they say 'The legitimate interests of the producer are fully served by identifying such product by appending the name or initials of the manufacturer, or by use of a general brand mark.' The same must be true over here."

The Council has met many arguments in its consideration of the nomenclature problem. In some instances there were honest differences of opinion; in others arguments were motivated solely by commercial reasons. And yet, in spite of these arguments it is interesting to notice that the names which have been coined or adopted by the Council as nonproprietary names have come into popular use, are listed in the U. S. P. or are recognized by judicial bodies as the common name. Excellent examples are arsphenamine, procaine, cinchophen, viosterol, chiniofon, menadione, sulfanilamide, sulfapyridine, sulfathiazole, riboflavin and thiamine hydrochloride.

Frequently representatives of manufacturers inform physicians that their product is not accepted "simply because of the name." As a result some physicians feel there is much unnecessary ado about nomenclature. Examination of the Council's past considerations (this is possible because every item of correspondence and other activities has been preserved and bound since 1905) refutes this unjust criticism and proves the fairness of the principles in the preceding paragraphs. In the past twenty years only eighteen articles have been rejected primarily because of the manufacturer's refusal to abandon a proprietary name which was in conflict with Council rules. Included were four tetraiodophenolphthalein sodium preparations, two bismuth suspensions, one barium sulfate suspension, one colorless tar preparation and one liquid petrolatum.

REFEREE'S CONSIDERATION

Admission of an article to N. N. R. does not imply a recommendation or "approval." It merely means that no conflict with the rules has been found by the Council and that the product has merit as a therapeutic agent. All products are submitted in accordance with certain rules. The firm must provide specimens of advertising material, specimens of the drug for laboratory examination, evidence in support of the efficacy and proposed claims, information on trade name and synonyms, definition, preparation, properties, tests, pharmacologic action, therapeutic indications, toxicology, dose, how supplied, manufacturer, patents and trademarks.

The Council office submits the firm's data, with other information in its files, to a Council member who serves as a referee. The referee prepares a report or puts in finished form a rough draft, which may have been prepared in the Council office by a consultant, and returns it to the Secretary, who, every two weeks, transmits such material to the other Council members by a mimeographed bulletin. Accompanying this report are speci-

mens of advertising material and other pertinent material which may aid the Council members in their decisions. Thus, each Council member has an opportunity to judge for himself the usefulness of the product, whether it complies with the Council's rules, and the report offered by the referee, who, incidentally, is an authority in the field of the subject which he is asked to consider.

In the next issue of the *Bulletin* to Council members appears the discussion by all members which may elicit information not available to the Council office or the referee. In the following issue of the *Bulletin* appears the vote to accept the product, reject or hold in abeyance. A three-fourths affirmative vote of the voting members (a nonvoting member being one who may be ill, temporarily out of the country or otherwise occupied) is necessary for the acceptance or rejection of a product. If a product is accepted the firm is notified immediately of the outcome of the Council's consideration. If any advertising claims must be revised or deleted or more supporting evidence provided before the product stands finally accepted, the firm is so notified. On the removal of these conditions the product then becomes accepted and a description is submitted to the editor of *THE JOURNAL* for publication and subsequent transferral to New and Nonofficial Remedies. If insufficient evidence is submitted by the manufacturer to justify the acceptance of its product at the time of consideration, the manufacturer is notified so that he may submit the lacking information. If he refuses or is unable to do so the product may be held in abeyance for further investigation or be immediately rejected. The manufacturer always is given opportunity to argue the Council's decision and may at any time ask the Council to reconsider the status of a rejected product.

Occasionally there is brought to the attention of the Council a new product which shows promise of usefulness but on which the experimental work has not been sufficient to make it ready for general use by the medical profession. In order to assure proper and controlled clinical study of such a product the Council issues a preliminary report on identity and standards, on the experimental work that has been done and on the further study that may appear desirable.

With the exception of the continuance of acceptance of a drug, all the Council's actions, whether of acceptance, rejection or omission, are published in *THE JOURNAL* and later in New and Nonofficial Remedies or in the Annual Reprint of the Reports of the Council on Pharmacy and Chemistry. This gives full publicity for all the Council's decisions to manufacturers and physicians alike.

The Council insists that the manufacturer must supply evidence for therapeutic and other claims. The Council is not equipped to initiate a clinical investigation of every drug that is submitted for its consideration. It does have the facilities of seventeen Council members to draw upon, the members' associates and other outstanding authorities throughout the entire country, these men serving gladly as Council consultants. A chemical laboratory maintained at A. M. A. headquarters examines the chemical composition of every submitted product before it is admitted to New and Nonofficial Remedies. Sometimes a manufacturer offers inadequate evidence to the Council when his product is submitted. Needless to say, this question of submitting evidence has been the cause of much confusion in the past and undoubtedly the cause of some criticism of the Council by certain manufacturers. It is anticipated that from now on this difficulty will approach a mini-

mum, because the outline by which each product is presented demands that the evidence must accompany the presentation. A scheme has been set up whereby well defined steps must be followed by the manufacturer when he presents his product so that all necessary data are available at one time for the Council's consideration. These steps are outlined in a booklet of rules which is available on request.

OFFICIAL DRUGS

Official agents and combinations of official agents are exempt from Council consideration if they are marketed with no unestablished claims and under the official name or synonym. Undoubtedly there are many who have noticed that N. N. R. contains official agents as well as nonofficial ones. This is because the Council feels that there are many official agents about which the medical profession is not sufficiently well informed, and since the U. S. P. does not provide statements of actions and uses the Council makes these available in N. N. R., Useful Drugs and the Epitome of the U. S. P. and N. F. Each year N. N. R. is revised so that the claims are in line with those generally accepted at the time of revision. Such yearly revision provides a book to which the physician may turn for authoritative and up-to-date information on the therapeutic value of drugs. Three years after acceptance each product is reviewed to determine if it is still in keeping with the Council's rules; if it is, the agent is accepted for another three years. At the end of each interval of three years, or more often, it is reexamined.

The agents described in the official compendiums (U. S. P. and N. F.) and New and Nonofficial Remedies total in number about 2,700. The U. S. P. lists approximately 650 articles, the National Formulary 730, and New and Nonofficial Remedies describes 1,300 agents. Without an actual count of the index cards which have been kept since the Council's inception in 1905 it has been estimated that the Council has probably considered from 250 to 400 products every year, thus providing an examination and evaluation of about 15,000 products in the last thirty-nine years. In addition, it has given consideration, not with the view to acceptance or rejection but for the purpose of making status reports, to probably 2,000 or more articles. U. S. P. XII and First Supplement will include about 114 agents previously described in N. N. R. and for which the Council had already provided standards. The articles described in the two official compendiums U. S. P. and N. F. and in N. N. R. provide an array of useful agents from which any medical practitioner may prescribe, regardless of his specialty. These books include almost all the useful drugs which are on the market; certainly they list all known agents which are essential to the practice of medicine. Of course, new drugs are developed, and as they are developed the Council watches closely their progress. When a firm submits a new one it is given immediate consideration by the Council. Sometimes the firm does not submit a product for various reasons, in which case the Council may initiate a report so that proper information may be available for the medical profession.

MISREPRESENTATIONS BY "UNACCEPTED FIRMS"

Some may wonder why certain firms do not stand "accepted" by the Council. Some of these firms have no products accepted simply because they have not asked for Council consideration. Others do not have accepted products because their policies have not yet been brought into conformance with Council requirements.

However, a number of new firms were included in N. N. R. in the past two years, and several more will probably be listed within the next few months. All these firms have taken it upon themselves to change their line of products and advertising policies. Old outmoded mixtures are being discarded for new, truly effective agents. Misleading and therapeutically suggestive names are being replaced by official or descriptive names. Advertising policies are becoming more conservative so that the physician can feel reasonably certain that the promoted claims are within reasonable bounds of accuracy. At present there are about 150 firms with products accepted by the Council.

Representatives of a few firms whose method of doing business has not resulted in recognition by the Council have in some instances made untrue representations to the effect that the Council charges a fee for examining drugs or that it "costs too much" to get a product passed by the Council, or that it is necessary to take out so much advertising in *THE JOURNAL* before the Council will accept a product. Such statements are completely false. The Council has never accepted, or permitted to be accepted, a cent of remuneration in any form for the consideration of products. The cost of the Council on Pharmacy and Chemistry, as well as that of the other A. M. A. councils, is borne entirely by appropriations made by the Board of Trustees of the American Medical Association. The Council is not influenced in the slightest by any proffer of advertising patronage; Council members are not advised by the Secretary of any information with respect to a proffer of advertising and there is no possibility of their action being influenced by where a product is advertised. If the Secretary learns of such a proffer, the firm is notified that it will have no effect on the Council's consideration. If any such charges against the Council reach the members of the profession, they should demand immediately that such charges be either substantiated or retracted.

DRUGS SOLD TO THE PUBLIC

Sometimes the Council is asked why it does not consider for acceptance more agents sold to the public. In the first place, such an undertaking would be a tremendous one. No one body of moderate size could ever hope to give consideration to all the agents that come and go. Of greater importance is the status of claims offered to the public; are such agents sufficiently effective to meet all the claims advanced? If they are this effective are they the kind of preparations that should be in the hands of medically untrained individuals? The evils of self diagnosis and self treatment are self evident.

ACCEPTABILITY OF COUNCIL RULES

Considering that the Council has no legal power, its power being only that derived from the press, enthusiastic followers and use of the seal, manufacturers on the whole are fairly good Council supporters. This has been evident even from the beginning, when the Council first adopted a set of rules and sent them to the manufacturers for comment. Most of the replies were favorable, some even enthusiastic—an indication that the aims of the Council were essentially similar to those of the higher class of pharmaceutical manufacturers. A few were openly antagonistic, but this antagonism bore almost a direct correlation with the practices of the firm. Torald Sollmann said in 1908 "The Council is bound to conflict with the commercial element where

this element conflicts with scientific progress; the manufacturers on the other hand must keep an eye on the dividends. . . ." It is interesting to note that the rules adopted by the Council in 1905 are essentially those in operation today, the only differences being editorial improvements and minor changes and additions which have been necessary from time to time to clarify the rules. After these rules had been in operation for half a year the Council arranged for a conference with the representatives of large manufacturing houses for an open discussion. This should be an answer to those who may ask if the Council's rules are sufficiently lenient. Apparently the manufacturers were satisfied at that time with the rules, and certainly consistent application over thirty-eight years has resulted in fairness for all. The Council has been and still is ready to consider carefully any suggestions for the improvement of these rules or of any activity in which the Council may be engaged.

DELAY IN COUNCIL ACTION

Occasionally the Council is criticized on the ground that it takes too long in its deliberations. This criticism deserves comment: Prolonged delays are almost invariably due to failure on the part of a manufacturer to submit the things for which he assumes full responsibility, for example, evidence or revised advertising claims. A product which is submitted with all necessary information and which does not violate the Council's rules can be accepted within a period of from six to ten weeks—surely not a very serious delay. If necessary, as when a manufacturer wishes his product Council accepted prior to bidding in certain contracts, or when a hospital or other body is anxious to have an immediate report, the Council can, by means of special Bulletins, complete consideration within two or three weeks. However, this is not a procedure that can be followed frequently, as it would upset the routine which has been found most effective to dispose of Council considerations.

Occasionally short delays are created by the referee being pressed at the moment with other duties. But as soon as these are removed the referee turns immediately to the Council problem. If he desires to prove or disprove certain claims by actual trial in his laboratory or clinic, a further short delay may result; but obviously such experimentation is of benefit to the physician and even the manufacturer submitting the questioned claims. The Council members assume a grave responsibility in declaring a product acceptable or nonacceptable, and they demand that the necessary data for careful consideration be available.

Sometimes manufacturers who have not had experience with the Council fail to understand what constitutes adequate evidence. The kind of evidence which the Council wants is that which will stand up before any critical examining body, the kind which a scientist would not be ashamed to present before a medical or other scientific group. Signed statements, even when they come from the best of men, do not constitute evidence if they are merely testimonial in character; several hundred signed testimonials are not equal to one or two good pieces of research.

OTHER QUESTIONS

Some critics have averred that the average physician is capable of judging the value of a product. Unquestionably he is trained to observe clinical responses. But

has he the time and the necessary detailed knowledge of bacteriology, pharmacology, toxicology, endocrinology and other special branches of medicine always to determine which patients might have recovered without drug intervention, which preparations are unnecessarily complex, which contain agents that are incompatible, which may have lost part of their effectiveness because of partial absorption into the container or by oxidation and the host of other factors that must be considered? Many of the manufacturers with products accepted by the Council would be the first to say no. Each member of the Council has spent many years of special study in some particular field and is able to give more accurately and more quickly answers to questions concerning Council submitted products.

The Council occasionally is asked if there is need for its existence with the new food and drug legislation. The answer is "yes." In the consideration of a new drug application the Food and Drug Administration under the terms of the 1938 Federal Food, Drug and Cosmetic Act is permitted to examine solely from the standpoint of safety. If this body attempts to question certain claims in the proposed advertising material it may be reminded by the manufacturer that advertising material not accompanying the market package is outside the jurisdiction of the Food and Drug Administration. Any action based on the consideration of claims for usefulness must be initiated on interstate shipments after a new drug application has been made effective.

Several considerations render it impossible for the Food and Drug Administration to consider the labeling and to determine the composition of all types of drug products after they have appeared on the market: first, limitations of the facilities and personnel made available for the enforcement of the Food, Drug and Cosmetic Act; second, the attention the Food and Drug Administration must give to the small segment of the industry that will always be engaged in the manufacture of products with wholly fraudulent or even vicious claims, and, third, the large number of pharmaceutical manufacturers and the tremendous number of products marketed. Furthermore, the Food, Drug and Cosmetic Act is applicable only to products in interstate commerce and many products do not go beyond the borders of the state in which they are manufactured. Unfortunately altogether too many state enforcement agencies have inadequate facilities for control of these products. Under these circumstances for a considerable volume of therapeutic agents which the physician uses, the only definite assurance he has that the labeling claims for them are in accordance with sound medical opinion is the appearance on the package of the seal of the Council on Pharmacy and Chemistry.

The Federal Trade Commission cannot exert the necessary control over medical advertising directed to the physician, as the act under which it operates for all practical purposes exempts the drugs so advertised. The Post Office Department acts only on complaints and then reserves its action for schemes in which the mails are used for fraudulent purposes. Usually, articles mailed to the public are involved. The National Institute of Health is concerned only with serums, vaccines, toxoids and analogous products in which are included certain antisyphilitic preparations. Other agencies, judicial and nonjudicial, are concerned mostly with protecting the public.

What other organization, then, is there to aid the medical profession in its consideration of drugs which it is importuned to use? And what agency can move as fearlessly as the Council on Pharmacy and Chemistry and obtain such immediate, militant and effective support as can be provided by THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION and the state medical journals?

According to some of the letters reaching the Council office, it appears that many physicians believe a non-acceptable product to be satisfactory simply because the Council has not issued a report of rejection. The Council has made no attempt to report on all unacceptable products, but it can and is prepared to issue very many more reports of rejection if necessary. It wishes to avoid such action if possible, as the more logical approach to the problem in which cooperation is desired and needed is to point the "do's" rather than the "don'ts." All of us are dealing with human individuals, few of whom like to be pushed, while many desire to be led.

ATTAINMENTS

The proprietary medicine business is essentially a development of the last seventy years. Nostrums placed on the market in the seventies and patented German synthetics became enormous in number in the early part of this century. Profits were immense and enticing. While a few of the compounds were of distinct value, the vast majority were simple mixtures of well known drugs put out under fanciful copyrighted names and for the most part fraudulent in one way or another; many were actually dangerous. Some were products from well known drug houses; the majority were put out by men who knew nothing of drugs or their effects but who went into the business of manufacturing medicines as they would any other business. Few hired competent chemical or medical advice, and as a result no statement was too silly or claim too extravagant. Those with a critical eye should have seen through the flimsy material offered as "evidence," but by persistent and occasionally clever advertising many were duped into buying and using these mixtures. Truly in these earlier days medicine in some instances could have been defined by the disappointed patient and physician as "the art or science of amusing a sick man with frivolous speculations about his disorders, and of tempering ingeniously until nature either kills or cures him." As early as 1879 the Association adopted resolutions condemning the use of these secret and semi-secret mixtures, but it remained for the Council on Pharmacy and Chemistry to ferret out the acceptable and unacceptable agents for the physician and journal advertising pages. The job was a tremendous one and encountered much opposition in the early days. However, by earnest and altruistic effort the Council members brought about a semblance of order in the existing chaos.

Many of the original objectives of the Council have been firmly established, partly because of the increasing appreciation of its work by the medical profession, partly because of the position it holds as a consultant body, partly because of the more conservative and scientific attitude of the average drug manufacturer. As a result the commercial production and distribution of medicinal products is on a higher plane in the United States than in any other country. But there is still a

long way to go; there must be close cooperation by all branches and representatives of the profession. If the advertising pages of medical journals are closed to medicinal agents which are not official or listed in N. N. R. there will be a powerful incentive for manufacturers to reach much more quickly the Council objectives, which are those of rational therapeutics. "Pharmaceutical manufacture is largely a business; and as such it will be ready to defer to the demands of its customers—the medical profession." To be completely effective, such a program must be participated in by every one interested in progressive medicine, not by just a few or others who may be part time participants according to their momentary interest. Otherwise the Council's efforts are stultified; representatives of the medical profession should be the Council's strongest supporters.

An interesting observation is the degree to which the public has become Council conscious. The Council office not infrequently has inquiries from physicians asking if a product is Council accepted simply because their patients have made such inquiries. Many people in lay audiences that are addressed by members of the headquarters staff ask about Council acceptance in a manner that indicates considerable familiarity with the Council and its seal. Any physician who fails to observe Council acceptance when he prescribes drugs for these persons is placed in an embarrassing position.

COOPERATION

A letter from the editor of a medical journal which was published in *THE JOURNAL* in 1913 reads, in part, "I do not believe that you realize just what the conditions are in the smaller communities . . . the question of supporting the Council on Pharmacy and Chemistry is . . . one which merits more consideration than we have given it. I do not believe that we are justified in making such strenuous efforts to reform the daily press and protect the public until after we have cleaned up our medical journals and made an effort to protect the public from the evils of incompetency and dishonesty. . . . So far as I am personally concerned I am through with temporizing, and the 'kid glove' manner of handling the vital subjects. I propose to hit the nail on the head when I know that I am right. It is a little hard for the average editor to look over the advertising income and do the right thing at the expense of the purse, but I think the medical profession should be given to understand that such effort is to be supported or else the medical profession should cease to own and operate medical journals."

If the various representatives of medical and other scientific groups are prepared to support the Council's efforts, they can provide much aid. Many hospitals purchase only official and N. N. R. drugs. Many medical journals accept for advertising only official and N. N. R. drugs. Many teaching centers suggest only these agents with the exception of others offering much experimental promise. The Council's work can be brought to the attention of those apart from teaching centers and modern hospitals by appropriate journal editorials and other articles, which must be repeated frequently to be most effective, by discussions on the Council and other A. M. A. bodies at medical meetings, by reproduction in medical journals and elsewhere of Council pronouncements and by restriction of advertising of drugs in medical journals to official and N. N. R. drugs.

The members of the medical profession desire truthful information on drugs in which they may be interested. This is evident in the letters arriving at the Council office. To determine the source of this interest the letters arriving since the first of 1943 have been examined for point of origin. This examination failed to reveal any direct correlation between free distribution of N. N. R. to medical students and inquiries (which might be expected, as probably not more than 50 per cent of students remain in the state in which they graduate) or between number of physicians in each state and the number of inquiries from that state. The number of inquiries from the seven states with the least number of physicians was found to be 1 inquiry per 1,200 physicians over any given period; in the seven states with the greatest number of physicians the inquiries totaled 1 per 400 physicians—a threefold increase. Perhaps this enormous increase bears a fairly direct relation to the amount of educational activities carried on within the state.

The degree of education regarding Council functions lies entirely in the hands of those who are interested sufficiently to further this education; there seem to be increasingly receptive audiences—there is definitely an increasing interest by the majority of scientific bodies. This interest occurs not without reason and should be fostered by every one anxious to achieve the utmost in rational therapeutics.

535 North Dearborn Street.

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

AUSTIN E. SMITH, M.D., Secretary.

THEOPHYLLINE ETHYLENEDIAMINE (See New and Nonofficial Remedies, 1943, p. 357).

The following product has been accepted:

G. D. SEARLE & Co., CHICAGO

Tablets Aminophylline: 0.1 Gm.

SULFATHIAZOLE SODIUM (See New and Nonofficial Remedies, 1943, p. 190).

The following product has been accepted:

LEDERLE LABORATORIES, INC., NEW YORK

Ampul Solution Sodium Sulfathiazole 25% W/V: 10 cc.

DIPHTHERIA TOXOID, TETANUS TOXOID, ALUM PRECIPITATED, COMBINED (See New and Nonofficial Remedies, 1943, p. 549).

The following dosage form has been accepted:

PITMAN-MOORE Co., INDIANAPOLIS

Combined Diphtheria-Tetanus Toxoid, Alum Precipitated: 1 cc. and 10 cc. vials in packages of two 1 cc. vials and of one 10 cc. vial. Preserved with 1:10,000 merthiolate.

SOLUTION OF EPINEPHRINE HYDROCHLORIDE 1:100 (See New and Nonofficial Remedies, 1943, p. 267).

The following product has been accepted:

BURROUGHS WELLCOME & Co., INC., NEW YORK

Solution of Epinephrine Hydrochloride 1:100: 5 cc. Contains epinephrine hydrochloride 1 per cent, chlorobutanol 0.5 per cent, sodium bisulfite 0.3 per cent and sodium chloride in isotonic solution.

SULFADIAZINE (See New and Nonofficial Remedies, 1943, p. 169).

The following dosage form has been accepted:

E. R. SQUIBB & SONS, NEW BRUNSWICK, N. J.

Sulfadiazine (Powder): 4 oz. and 1 lb. packages.

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SATURDAY, FEBRUARY 12, 1944

NOTES ON HUMAN TOXOPLASMOSIS

In the course of his work on malarial and other hematozoa, Laveran¹ observed that Brazilian and Tunisian strains of the protozoon that came to be known as *Toxoplasma* were alike not only in form and mode of reproduction but also in pathogenic action. This action extended to many species of mammals and even birds. In this country Sabin and Olitsky² studied the intracellular parasitism of *Toxoplasma* and established the pathogenic and immunologic identity of different strains fatal to mice, guinea pigs, rabbits and chickens but not to Rhesus monkeys, the serum of which on recovery was found to have antitoxoplasmic properties.

In relation to human toxoplasmosis, Wolf, Cowen and Paige made morphologic studies in distinctive cases of granulomatous encephalomyelitis in infants, in the lesions of which were protozoon organisms. In 1939 they³ demonstrated the etiologic agent in such cases to be *Toxoplasma* by transmitting the infection from a typical case in an infant to rabbits and mice. At the same time Sabin⁴ showed that human and animal strains of *Toxoplasma* were identical. Wolf and his associates have reported several well observed cases of toxoplasmic encephalomyelitis in infants. *Toxoplasma* may cause encephalitis and other lesions in older children⁵ and visceral involvements in adults.⁶ The 2 cases of adult toxoplasmosis observed by Pinkerton and Henderson in Missouri simulated the clinical and cutaneous phenomena of the typhus-spotted fever group. Toxoplasmosis, infantile and adult, has just been

reported from rural districts in Brazil.⁷ Another case of infantile toxoplasmosis is reported from Detroit.⁸ The wide distribution of the scattered cases of human toxoplasmosis suggests that the disease may be more frequent than is now recognized.

As yet the mode of transmission in animals and man of toxoplasmic infection is not known. In the infantile form of toxoplasmosis the advanced nature of lesions at birth, often calcified and associated with structural defects, point to prenatal infection. Evidences of active disease with the presence of protozoa have been found in the bodies of stillborn infants. While the serum of mothers of such children may contain antitoxoplasmic bodies, there is no record of active maternal disease in any of the cases, and the mechanism of the fetal infection also remains wholly unknown. Apparently it might result from a latent or inapparent infection of the mother. Close examination of the placenta may help to solve the problem. Latent toxoplasmosis occurs in animals, and the suggestion has been made that further search for evidences of latent human toxoplasmosis should be conducted along the lines of the work by Sabin.⁵

The characteristic lesions in the nervous system in the infantile form of toxoplasmosis are of a chronic, granulomatous, nonsuppurative nature with necrosis and calcification, hydrocephalus and a typical bilateral chorioretinitis.⁹ In the clinical diagnosis, consideration must be given to the signs of cerebral injury, to the x-ray evidence of calcification and hydrocephalus and to the ophthalmoscopic examination for chorioretinitis. The protozoon itself, a microscopic, crescentic, pyriform or oval organism with a chromatin mass, may be demonstrable in smears of exudate and in sections of the granulomatous tissue. The organism may occur singly, intracellular or free, as well as in rounded aggregations or pseudocysts. Toxoplasmosis can be produced in guinea pigs, mice and rabbits by the injection of infectious materials—exudate, cerebrospinal fluid, blood—from the patient. The serum of the patient may contain antitoxoplasmic bodies.¹⁰ Infantile toxoplasmosis is usually fatal within a few weeks after birth, but patients have survived up to four years or so, though with mental deficiency and epileptiform convulsions. The 8 year old boy observed by Sabin⁵ recovered completely, beginning with the tenth day.

Enough has been said to indicate the outlines of the knowledge gained in the last few years of human toxoplasmosis, a protozoan infection not previously recognized. In this rapid advance the work by Wolf and his

1. Phisalix, Marie: Laveran, Alphonse: *La vie, son oeuvre*, Paris, Masson & Cie, 1923, p. 77.

2. Sabin, A. B., and Olitsky, P. K.: *Toxoplasma and Obligate Intracellular Parasitism*, Science **85**: 336 (April 2) 1937.

3. Wolf, Abner; Cowen, David, and Paige, Beryl H.: *Human Toxoplasmosis: Occurrence in Infants as an Encephalomyelitis; Verification by Transmission to Animals*, Science **89**: 996, 1939. *Toxoplasmic Encephalomyelitis. IV. Transmission of Infection to Animals from a Human Infant*, J. Exper. Med. **71**: 187 (Feb.) 1940.

4. Sabin, A. B.: *Biologic and Immunologic Identity of Toxoplasma of Animal and Human Origin*, Proc. Soc. Biol. & Exper. Med. **41**: 75, 1939.

5. Sabin, A. B.: *Toxoplasmic Encephalitis in Children*, J. A. M. A. **116**: 801 (March 1) 1941.

6. Pinkerton, Henry, and Weinman, David: *Toxoplasma Infection in Man*, Arch. Path. **30**: 374 (July) 1940. Pinkerton, Henry, and Henderson, R. G.: *Adult Toxoplasmosis: A Previously Unrecognized Disease Entity Simulating the Typhus-Spotted Fever Group*, J. A. M. A. **116**: 807 (March 1) 1941.

7. Two New Cases of Human Toxoplasmosis, Brazil Letter, J. A. M. A. **124**: 252 (Jan. 22) 1944.

8. Steiner, G., and Kaup, D. H.: *Infantile Toxoplasmic Encephalomyelitis: Report of a Case*, J. Neuropath. & Experiment. Neurol. **3**: 36 (Jan.) 1944.

9. Koch, F. L. P.; Wolf, Abner; Cowen, David, and Paige, Beryl H.: *Toxoplasmic Encephalomyelitis. VII. Significance of Ocular Lesions in the Diagnosis of Infantile or Congenital Toxoplasmosis*, Arch. Ophth. **29**: 1 (Jan.) 1943.

10. Sabin, A. B.: *Toxoplasma Neutralizing Antibody in Human Benign and Morbid Conditions Associated with It*, Proc. Soc. Biol. & Exper. Med. **51**: 6 (Oct.) 1942.

associates has been of fundamental significance. Many questions arise. How about the frequency and nature of other forms of toxoplasmosis than the congenital or the infantile? How is the disease acquired? How can it be prevented and how can it be treated successfully? Is there a chronic form of human toxoplasmosis as suggested by Weinman?¹¹ Are there carriers of Toxoplasma?

**MUST PREPAYMENT FOR MEDICAL
SERVICE BE COMPULSORY?
THE WAGNER-MURRAY-
DINGELL BILL: IV**

The basic argument for compulsory sickness insurance is the financial one—that the cost is with certainty distributed in time and over a larger body of people. Compulsory sickness insurance, according to such evidence as is available from other countries, inevitably deteriorates the quality of medical service by spreading it more and more thinly to meet the financial resources and polluting it by politics. Admittedly, like all insurance, it spreads the expense of unanticipated illness.

Can the fundamental objectives of spreading expense be attained without compulsion? The House of Delegates of the American Medical Association has repeatedly adopted resolutions encouraging state and county medical societies to organize experimental prepayment plans. Many such plans—at least twenty—several of them statewide, are now in operation or in process of organization. The first was begun about six years ago; now approximately a million members are receiving medical care through such plans.

Prepayment plans for hospitalization, also endorsed by the House of Delegates, have expanded in a decade to nearly every state and now include some fifteen million members. Medical society prepayment plans have cooperated with hospital plans as well as with the Farm Security Administration, Social Security, Care of the Indigent, Federal Housing Projects and Industrial Medical Plans. The functioning of these relationships has not always been smooth, nor have relations with other agencies been without occasional friction. There have been conflicts, mistakes and disagreements. Those who think that compulsion removes difficulties will be quickly undeceived by a glance at the volumes of legislation, litigation and regulations that have sought to patch defects in compulsory systems. Medical society prepayment plans have also had their administrative and financial difficulties, but at least the prepayment plans under auspices of medical societies seldom permit the medical service to deteriorate in quality. Medical society plans concentrate on the minimum interference with mutual free choice between physician and patient.

Prepayment plans are still experiments—compulsory no less than voluntary; both are evolving and changing.

11. Weinman, David: Chronic Toxoplasmosis, *J. Infect. Dis.* **73**: 85 (July Aug.) 1943.

Compulsory plans are anchored to financial, administrative and political considerations, to which the quality of medical service must be made to conform. Medical society prepayment plans make good medical care the stable element to which all else must be adjusted. Medical society plans grow and develop with the progress of medicine and the health needs of the public. Compulsory plans are imposed by forcible revolution, fixed by law and changeable only through political pressure. The vested interests which they create and protect are those of partisan politics. The health of the public and the progress of medical art and science seem to be secondary to administrative considerations, notwithstanding the protests and iterations of legislators that they are concerned only with the delivery of medical service. Had they been so concerned they would at least have consulted with the medical profession as to possible technics by which the desirable objectives could be secured.

**FETAL ERYTHROBLASTOSIS AND THE
Rh FACTOR**

Rarely has a medical discovery been so quickly and so widely accepted as has the significance of the Rh blood factor. Almost immediately after the first report¹ of its discovery the new factor aroused general interest far beyond the narrow circles of investigators especially interested in blood grouping. At present, only four years later, the term Rh factor not only has become a part of the medical vocabulary but has achieved the distinction of being discussed in the lay press.

This rapid recognition no doubt is due to the circumstance that the new blood factor has helped to solve two baffling medical problems, namely the so-called hemolytic and sometimes fatal intragroup transfusion reactions² and the genesis of fetal erythroblastosis.³ Both have now been shown to result from the immunization of Rh negative persons by Rh positive blood. This immunization may be produced by the transfusion of Rh positive blood or during pregnancy. In pregnancy an Rh negative mother is assumed to receive Rh positive blood from the fetus, which the latter has inherited from his Rh positive father. In either case an Rh negative person, thus immunized, may not tolerate Rh positive blood, although it is otherwise of the same blood group as his own.

Anti Rh agglutinins as produced by immunization of the mother may pass through the placenta to the fetus, damage its blood corpuscles and bring about hemolytic anemia with its sequelae: erythroblastemia, jaundice and edema; that is, fetal erythroblastosis. In other words,

1. Landsteiner, Karl, and Wiener, A. S.: An Agglutinable Factor in Human Blood Recognized by Immune Serums for Rhesus Blood, *Proc. Soc. Exper. Biol. & Med.* **43**: 233 (Jan.) 1940.

2. Wiener, A. S., and Peters, H. R.: Hemolytic Reactions Following Transfusions of Blood of the Homologous Group, with 3 Cases in Which the Same Agglutinin Was Responsible, *Ann. Int. Med.* **13**: 2306 (June) 1940.

3. Levine, Philip; Katzin, E. M., and Burnham, Lyman: Iso-immunization in Pregnancy: Its Possible Bearing on the Etiology of Erythroblastosis Fetalis, *J. A. M. A.* **116**: 825 (March 1) 1941.

the mechanism of erythroblastosis fetalis depends on isoimmunization of the mother by the Rh factor in the blood of the fetus, which thus may jeopardize its mother in the event of transfusion, and on the intrauterine action of anti Rh agglutinin on susceptible fetal blood. This explanation of the relation of the Rh factor to erythroblastosis is supported by statistical, immunologic and clinical evidence, and there can be little doubt as to its essential validity.

RUSSIAN SURGEONS AND RUSSIAN SURGERY

The reports of the individual members of the Anglo-American Surgical Mission to Russia agree in their impressions of the people, the surgeons and the surgical military service of the Soviet Union. Watson-Jones¹ states that during his three weeks stay in Moscow he did not observe any signs of malnutrition in the adults or any evidence of rickets in the children. His first impression was the overwhelming hospitality of the Russians; the second was the astonishing capacity of Russian women for hard work. Women doctors, women surgeons and nurses work in the front line; many of them wear the chevrons of multiple wounds. The inspector general of the medical service of the Red Army is a woman.

Members of the mission thought that the organization of the surgical service was superb. A distinctive feature is the principle of segregation of patients. This is begun almost at the front line. After the patient has been admitted to the front line hospital he is referred to orthopedic, neurosurgical, thoracoabdominal, lightly wounded or other wards. Each ward is equipped with its own x-ray and operating suite; treatment by skilled specialists is instituted within 10 to 20 miles of the front lines and within twenty-four to forty-eight hours after wounding. The principle of segregation is carried beyond the specialist wards of the sorting-evacuating hospitals to specialized hospitals farther behind the line. So great has been the flow of casualties that it has even been practicable to devote 2,000 bed hospitals to gunshot wounds of the thigh, to penetrating wound of the hip joint and to other special injuries. Watson-Jones felt that the blood donor system of Moscow is worthy of emulation. It is a model of careful organization, of the highest possible standard of operating room asepsis and of repeated check and control of both contamination and accurate blood grouping.

While surgical principles are much the same everywhere, some differences in the detail of their application was found. Yudin practices excision of the wound regardless of the time limit or the state of infection. He excises all necrotic tissue and keeps the wound wide open by suturing the skin to the deep fascia. No tube, drain or gauze pack is placed in the wound. The

closed plaster technic is used for all major wounds, compound fractures and joint injuries. In treatment of joint wounds many surgeons prefer resection of the joint to arthrotomy. Sulfonamides are used, and the limb is immobilized in a plaster cast.

The hospitals for cerebral surgery have on their staff a neurosurgeon, a neurologist, a neuropathologist, an ophthalmologist, an otorhinologist and a radiologist. The patients are transported by air at heights not greater than 5,000 meters. Operation is deferred until skilled surgeons and equipment are available. Expert study and operation two or three days after wounding are considered better than inexperienced operations performed immediately.

Watson-Jones also lists such innovations as ultrasonic emulsification of therapeutic agents, intracarotid injection of sulfonamides, intracisternal injection of antitetanic serum, cap splints for maxillary fractures, gap fractures of long bones, acrylic resin for dentures (which are delivered many miles behind enemy lines), plastic reconstruction of the penis by tube grafts and cartilage inlays, producing an organ capable of both urination and erection, and the treatment of esophageal stricture by jejunal transplants. The astonishing fact is that so high a standard of surgery has been achieved in a country where full development is so young and where contacts with the surgery of other countries have been so limited. The Russians have, of course, their great surgeons as well as their poor ones. The mission was rather impressed by the vast scale on which surgery is done in Russia. Thus Yudin performed for the visitors in one morning three operations of replacement of esophageal stricture by jejunum.

Watson-Jones concludes that the Russian surgeons have nothing fundamental to learn from us, nor we from them. He believes that Soviet surgeons would gain from visits to other countries; in this way their technic would be improved; but he believes with equal conviction that the mission gained from its visit to them. The Anglo-American surgeons did not approve of all they saw; they disagreed with the Russians on the treatment of frostbite; they were unconvinced of the merit of muds, balsams and wood distillates; they thought that our rehabilitation is better than the Russians'; but much of the Soviets' work is better than ours: Their specialization is excellent; their training of medical students is thorough; their organization of surgical services is superb. The efficiency of their organization, with its emphasis on specialization, is probably one of the reasons why the Russians return 70 per cent of their wounded to the firing line. Another factor may be the toughness of the Russian constitution. According to Penfield² psychoneurosis is rare in the Soviet Union, for they have an ample supply of its specific antidote, high morale.

1. Watson-Jones, Reginald: *Russian Surgeons and Russian Surgery*, Bull. War Med. (Medical Research Council) 4: 121 (Nov.) 1943.

2. Penfield, Wilder: *The British-American-Canadian Surgical Mission to the U. S. S. R., Canad. M. A. J.* 40: 455 (Dec.) 1943.

Current Comment

FORTY YEARS OF SERVICE TO THE MEDICAL PROFESSION

This week the Council on Pharmacy and Chemistry enters its fortieth year of service to the public and the medical profession. Since its first meeting on Feb. 11, 1905 the Council has fought continuously for rational therapeutics. It has created much change in the practice of therapeutics. Its activities and decisions are highly respected and are followed internationally by leading medical authorities; its advice is sought frequently by administrative, advisory and educational bodies in this country and in others. Elsewhere in THE JOURNAL (p. 433) is a communication outlining the membership, activities, method of operation and attainments of the Council on Pharmacy and Chemistry. Undoubtedly this will be of interest to all, and of special interest to those who have been the more ardent Council supporters. It is fortunate indeed for the public and the medical profession that there exists an unselfish body such as the Council which can give scientific consideration to rational therapeutics and issue its statements without fear or favor.

THE KIDNAPING OF SUN YAT-SEN

Four celebrated physicians played an important part in an incident which had great influence on the history of China. The story is related by Dr. Sze in the *Chinese Medical Journal*.¹ The four men concerned are Sun Yat-Sen, the first president of the Chinese Republic, Sir Halliday Macartney, Sir Patrick Manson and Sir James Cantlie. Sun Yat-Sen arrived in London on Oct. 1, 1896, an exile and a fugitive from China after an abortive attempt at a revolutionary uprising. He was tricked on October 11 into entering the Chinese legation, where he was locked up and preparations were made for his shipment back to China and execution. Fortunately for Sun Yat-Sen, he succeeded in having a message sent to Sir James Cantlie, apprising him of the situation. Cantlie engaged the assistance of Sir Patrick Manson and of the foreign office, so that when the representative of the latter called at the Chinese legation on October 23 to demand the release of their prisoner this was immediately complied with by Sir Halliday Macartney, the English secretary of the Chinese legation. The career of Sir Patrick Manson, the "Father of Tropical Medicine," is too well known to require comment. That of Macartney and of Cantlie are perhaps less well known to the American profession. Cantlie joined Manson in 1887 in the practice of medicine in Hongkong. During his nine years of practice there he founded the Peak Hospital, the Vaccine Institute, the Hongkong branch of St. John's Ambulance Brigade and the Hongkong College of Medicine. The very first student to matriculate in that college was Sun Yat-Sen. Cantlie's researches were particularly on leprosy, plague, liver abscess and sprue. During the

plague epidemic of Hongkong in 1894 Cantlie worked with Yersin and thus shared in the investigations which resulted in the discovery of the plague bacillus. Cantlie returned to London just a few months before the kidnapping of his former student, in whose rescue he was to play the leading part. Sir Halliday Macartney began his career as a British army surgeon in the Peking expedition of 1860. He soon acquired knowledge of the Chinese language, married a Chinese woman and later left his medical career to enter the service of the Dragon Throne. He played a prominent part in peace negotiations between General Gordon and Li Hung-Chang. In 1876 Macartney was made English secretary of the Chinese legation in London, in which position he served twenty-nine years. The growth of the republic of China may be traced to the success of this famous kidnapping.

OVARIAN INSUFFICIENCY

Female hypogonadism is generally classified into primary hypogonadism, due to ovarian insufficiency associated with a secondary increase in production of gonadotropic hormones, and secondary hypogonadism, in which ovarian insufficiency is secondary to the decreased production of gonadotropic hormones. A method suitable for the clinical determination of the urinary levels of gonadotropic hormones was developed by the Hellers¹ and has now been used by Klinefelter, Albright and Griswold² in the reinvestigation of the problem of ovarian insufficiency. The normal levels of daily urinary excretion of follicle stimulating hormone, established in a control group of 35 normal persons, were found to vary between 6.6 and 53 mouse units. Values below and above these figures were interpreted as due to decreased and increased production of follicle stimulating hormone respectively. On the basis of these excretion levels three different types of hypoestrinism were recognized. The first group includes primary ovarian insufficiency with lack of estrogens and consequent increased production and excretion of follicle stimulating hormone. The second type is represented by pituitary hypoestrinism due to primary deficiency in the production of follicle stimulating hormone and consequent association of estrogen lack with decreased urinary excretion of gonadotropic hormone. The third category includes patients in whom ovarian insufficiency is accompanied by normal values of follicle stimulating hormone in the urine. On the basis of present knowledge, the finding of this association of low estrogen level with normal gonadotropin production is unexpected and difficult to interpret. Since pure follicle stimulating hormone is unable to produce estrogen excretion in the absence of luteinizing hormone, a deficiency of the latter hormone was postulated to account for the ovarian insufficiency in this group. Further, since there is evidence to indicate that the release of luteinizing hormone is

1. Sze, Szeming: Four Doctors and a Famous Kidnapping, *Chinese M. J.* 61: 172 (April-June) 1943.

1. Heller, Carl G., and Heller, Emily J.: Gonadotropic Hormone: Clinical Application of Extraction Methods for Assay Purposes, *Endocrinology* 24: 319 (March) 1939.

2. Klinefelter, A. F., Jr.; Albright, Fuller, and Griswold, G. C.: Experience with a Quantitative Test for Normal or Decreased Amounts of Follicle Stimulating Hormone in the Urine in Endocrinological Diagnosis, *J. Clin. Endocrinol.* 3: 529 (Oct.) 1943.

under the control of the hypothalamus, these cases have been tentatively classed as hypothalamic hypoestrinism. Confirmation of this hypothesis must await demonstration of an actual hypothalamic defect and also development of adequate methods for the separate clinical assay of the luteinizing and the follicle stimulating factors.

COMPLEMENT FIXATION TEST FOR VENEREAL LYMPHOGRANULOMA

Attempts to develop diagnostic aids for venereal lymphogranuloma have been concentrated on the skin reaction usually called the Frei test and the complement fixation test. Although there have been many favorable reports on the Frei reaction, others¹ have not been satisfied with this test. Adherents of the complement fixation method, Grace and Rake now report that antigens made from lymphogranulomatous nodes or pus are unsatisfactory for the performance of this test because of their low content of virus; however, a new yolk sac antigen consisting of a suspension in isotonic solutions of sodium chloride of the elementary bodies of the virus can be prepared with any desired concentration of virus. They employed antigens of this type on 202 persons with a variety of clinical conditions, finding the reaction positive in the serums of 130 and negative in those of 72 persons. Comparisons with the Frei test, according to these observers, indicated that the complement fixation test is more sensitive than the Frei reaction and does not involve the difficulties of comparing the diameters of papules as the skin test requires. Grace² suggests that this test be named after Rake, who is, he says, responsible for its introduction in its present valuable form.

PHARMACY TEACHING STANDARDS

Ordinarily the course in pharmacy requires thirty-six months spread over four years. As a wartime measure the degree can be obtained in three years (by eliminating vacations). This acceleration appears to be in keeping with that for other scientific curriculums. Recently leaders in the pharmacy profession considered a proposal for an acceleration which would permit a degree in twenty-four months. The proposal was emphatically rejected by the American Association of Colleges of Pharmacy and the National Association of Boards of Pharmacy. These bodies apparently feel that immediate corrective measures for any momentary shortages are not as important as a long range policy which will permit maintenance of present standards and an assurance of well qualified pharmacists in the years to come. The action of these bodies seems to be in conformance with the thoughts expressed by representatives of the majority of pharmacy schools and colleges and by those vitally interested in the welfare of pharmacy as a profession.

POSTOPERATIVE PAIN IN TOTAL PNEUMONECTOMY

Postoperative pain following total pneumonectomy is considered by Johnson¹ to be an important contributing factor in the production of cardiorespiratory complications. It acts (1) by preventing a normal rate and rhythm of respiratory movements, (2) by preventing the patient from lying on the operated side, thus hindering the dependent drainage of the secretions from the remaining lung, and (3) by restraining cough, thus allowing mucus to accumulate in the tracheobronchial tree. As a result, the patient will suffer from anoxia, such complications as cardiac failure, atelectasis, drowning in the infective secretions of the lung or from a bronchopleural fistula, shift of the mediastinum toward the remaining lung will be produced or aggravated, and therapeutic measures to counteract these complications impeded. Since morphine sedation is accompanied by the hazard of further respiratory depression, simple crushing of the intercostal nerves in the areas surrounding the incision is recommended by Johnson.² In 10 cases in which this simple procedure was performed, an area of anesthesia resulted, making it possible for the patient to lie on the operated side to allow dependent drainage, to maintain deep, even respirations, insuring normal pulmonary ventilation, and to cough out secretions from the tracheobronchial tree.

PSYCHOMETRIC STUDY OF SENILITY

According to Halstead,¹ systematic, standardized mental measurement in old age is in the early stages. Halstead is studying senile patients in two London hospitals and describes the methods and results of a special study of 20 patients, 68 to 83 years of age, the less seriously demented of a larger group of subjects. In this study twenty-five short tests, requiring about one hour for each patient, were used. These tests are submitted as "a tentative battery for a further investigation of senescence." Halstead points out that mental tests for senility must be short "because of straying attention, impaired comprehension and short retention" of the subjects. The details of his tests cannot be given here, but some of the main results may be quoted. The subjects tested "found it difficult to reverse old habit sequences, to retain visual and auditory material of a meaningful kind, and showed impairment in such qualities as judgment, planning and spatial discrimination. They were somewhat better at rote memorizing and in fluency of old associations. They showed up best on immediate recognition (visual), early acquired habit patterns and simple motor tasks." The value, practical as well as scientific, of work like Halstead's is obvious, and the outcome of continued studies of the mental changes in advancing years will be awaited with much interest.

1. Grace, A. W., and Rake, Geoffrey: Complement Fixation Test for Lymphogranuloma Venereum, *Arch. Dermat. & Syph.* 48: 619 (Dec.) 1943.

2. Grace, A. W.: The Chick Embryo Antigen (Lygranum) Test for Lymphogranuloma Venereum, *Arch. Dermat. & Syph.* 48: 659 (Dec.) 1943.

1. Johnson, Julian: Postoperative Pain Following Total Pneumonectomy: I, *J. Thoracic Surg.* 12: 697 (Dec.) 1943.

2. Johnson, Julian: Postoperative Pain Following Total Pneumonectomy: II, *J. Thoracic Surg.* 12: 702 (Dec.) 1943.

1. Halstead, H.: A Psychometric Study of Senility, *J. Ment. Sci.* 89: 363 (July-Oct.) 1943.

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeons General of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war, and such other information and announcements as will be useful to the medical profession.

ARMY

COURSE TO TRAIN OFFICERS FOR DUTIES OF ASSISTANT BATTALION SURGEONS

The first six week class of the School for Medical Administrative Corps Officers began training recently at the Medical Replacement Training Center, Camp Berkeley, Texas, to qualify officers for the duties of assistant battalion surgeons serving in battalion aid stations. Located a few hundred yards to the rear of the battalion in combat that it supports, the station receives and treats slight wounds and renders emergency treatment, such as the administration of blood plasma, to seriously wounded casualties. The principal purpose of the battalion aid stations is to supervise quick evacuation of the seriously wounded by litter to the rear. Under command of the battalion surgeon, each station is in the charge of an assistant battalion surgeon, who at present is a first lieutenant or captain, M C.

The course is being given in an effort to relieve thousands of medical officers for duties more demanding of their complete professional knowledge and is the first of its kind designed by formal instruction to train officers specifically for this work. The courses will include instruction only in technical, medical and surgical work and that which will fit the officers for their duties at the aid stations. The large majority of the allotted hours will cover field medicine and surgery with other subjects, including sanitation and tactics and shorter periods devoted to logistics and administration. The subjects will be treated practically, with as much application as possible. Classes in the field medicine course will include anatomy and physiology, bandaging and dressing, splints and emergency treatment. Miscellaneous hours will include transportation of casualties, transfusions, chemotherapy and penicillin, tropical diseases, immunization and the care of psychiatric casualties. Brig Gen Roy C Heflebower is commandant of the school.

MAJOR THOMAS C. BRANDON AWARDED LEGION OF MERIT

The War Department recently announced the award of the Legion of Merit to Major Thomas C. Brandon "for exceptionally meritorious conduct in the performance of outstanding service as surgeon of the Eritrea Service Command in the organization and operation of a medical service in the occupied enemy territory of Eritrea from February 5 until June 1942 and later as surgeon of the Levant Service Command, Services of Supply, United States Army Forces in the Middle East. Major Brandon, under the most trying circumstances and without adequate medical facilities, succeeded in maintaining the health of several hundred American civilian employees operating in the Eritrea and Palestine areas in addition to caring for the military personnel. In a strange country where climatic and sanitary environment is detrimental to the average American, Major Brandon, unaided by any other medical officer or suitable assistants, in addition to caring for this unusual number of personnel, established a preventive sanitary program which succeeded in preserving the health and working ability of all American personnel in these areas. His expert professional attainments, energy and untiring efforts aided immeasurably to the state of health and morale of the command. Dr Brandon formerly lived in Williamsport, Pa. and graduated from Jefferson Medical College of Philadelphia in 1935. He entered the service in March 1941.

GENERAL HOSPITALS DESIGNATED FOR SPECIALIZED TREATMENT

Paragraphs 3 and 5 in circulars issued by Headquarters Army Service Forces Nov 23 and Dec 17, 1943, regarding general hospitals designated for specialized treatment, are amended in Circular No 31, dated January 27, and read as follows:

"Individual patients in a station or general hospital who require specialized treatment of a type provided in a general hospital designated for such specialized treatment will be transferred to such general hospitals after direct communication between the two hospitals has insured the availability of a bed. Whenever possible such cases will be sent to the general hospital nearest the patient's home which provides the specialized treatment required.

"Authority to issue orders transferring such patients from a station hospital or from one general hospital to another may be delegated by the service command headquarters to the commanding officers of the posts, camps or stations and the commanding officers of named general hospitals. In such cases the service commands concerned will be furnished information copies of all orders so issued."

GOLD WINGED BADGE FOR ARMY AIR FORCES FLIGHT NURSES

The War Department announced on January 18 the adoption of a gold winged badge for flight nurses of the Army Air Forces which is similar to the flight surgeon's wings except that it is smaller and consists of the combat observer's badge with the insignia of the Army Nurse Corps superimposed in the center. These wings have been authorized for wear by nurse graduates of the School of Air Evacuation, Bowman Field, Ky., who have been assigned to flight duty. Five hundred have graduated since the flight nurses' training program was begun a little more than a year ago. Flight nurses now are serving with Army Air Forces' air evacuation units in all major combat zones, as well as with units assigned to global air transport routes. They take care of the wounded, sick and injured soldiers being evacuated aboard transport and cargo planes.

ARMY PERSONALS

Major Cornelius O. Bailey, Los Angeles, was appointed surgeon general of the Military Order of the World Wars at the national convention held recently in Cincinnati. Dr Bailey will fill the position formerly held by Col Joseph M. Heller, who died recently. The Military Order of the World Wars is a patriotic organization whose membership consists of commissioned officers of both world wars.

Dr John E. Elmendorf, until recently of the Rockefeller Foundation, International Health Division, was given a leave of absence for the duration of the war to accept a commission as lieutenant colonel in the Army Medical Corps and is in charge of professional activity and personnel in the Army School of Malariology, Quarry Heights, Canal Zone. Dr. Elmendorf is a well known malariologist with twenty years of activity in the prevention and control of malaria and yellow fever. He has promoted health laws, conducted field research and instituted projects for the control of tropical fevers in Costa Rica, Guatemala, Venezuela and Brazil. At the time he was commissioned last December he was in charge of a school of malariology for the Army and Navy officers in the Pensacola area.

MISCELLANEOUS

CHOICE OF STUDENTS BY DEANS
OF MEDICAL SCHOOLS

The Directing Board of the Procurement and Assignment Service urges that if at all possible the 20 per cent of places not covered by Army and Navy contracts in classes entering medical schools after Jan. 1, 1945 be filled with students who on graduation will not be obligated for military service: that is, with women and men physically disqualified. This is the only group that can be depended on to serve as replacements for physicians in civilian practice.

Only in case a school does not have a sufficient number of acceptable applicants in this category to fill these places should the number of Army and Navy students accepted exceed 80 per cent. It is urged also that decision to accept more than 80 per cent of students from the armed forces be postponed until the latest possible date.

HOSPITALS NEEDING INTERNS
AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their house staff quotas allotted by the Procurement and Assignment Service:

(Continuation of list in THE JOURNAL, February 5, p. 370)

COLORADO

Memorial Hospital, Colorado Springs. Capacity, 87; admissions, 2,814.
Edward Rowlands, Superintendent (2 residents).

ILLINOIS

St. Anthony's Hospital, Rock Island. Capacity, 150; admissions, 3,357.
Mother Mary Christopher, Administrator (1 resident).

MICHIGAN

St. Lawrence Hospital, Lansing. Capacity, 185; admissions, 6,897.
Sister Mary Assisium, Superintendent (3 interns).

WARTIME GRADUATE MEDICAL MEETINGS

Among the subjects scheduled for early presentation under the auspices of the Wartime Graduate Medical Meetings are, at Camp Kilmer, N. J.: Head Injuries, Their Diagnosis and Treatment, Dr. Temple Fay, March 13; Management of the Anesthesia Period, Dr. Frederick P. Haugen and Lieut. Comdr. Don Hale, March 27.

At the Naval Hospital, Philadelphia: Obstructive Lesions of the Urinary Tract and Their Relationship in the Production of Renal Pathology, Dr. Joseph Birdsall and Capt. J. R. Waterman, March 3; Physical Therapy, Lieut. Comdr. Jacob L. Rudd, March 17; Psychosomatic Aspects of Cardiovascular Disease, Dr. Edward Weiss and Lieut. M. M. Pearson, March 31.

At Indiantown Gap, Pa.: Psychiatric Contributions to Medicine, Dr. Kenneth Appel, March 2; Psychosomatic Aspects of Gastrointestinal Disorders, Dr. Edward Weiss, March 9; Management of the Anesthesia Period, Dr. Frederick Haugen, March 16; Anesthesia: A. Spinal Anesthesia; B. Intravenous Pentothal, Dr. Henry S. Ruth, March 23; Treatment of Syphilis, Dr. Francis G. Harrison, March 30.

At Fort Monmouth, N. J.: Digitalis, Dr. William D. Stroud and Capt. Solomon J. Selikoff, March 1; Peripheral Vascular Disorders, Dr. David W. Kramer, March 8; Treatment of War Wounded in Naval Hospital Physical Therapy Department, Lieut. Comdr. Jacob L. Rudd, March 15; Short Wave Diathermy Treatment, Dr. William H. Schmidt, March 15; Ultraviolet Therapy, Dr. A. A. Martucci, March 15; Treatment of War Wounded in Naval Hospital Physical Therapy Department, Lieut. Comdr. Jacob L. Rudd, March 22; Posture, Physical Exercise and Massage, Dr. Leonard D. Frescoln, March 22; Diabetic Complications, Dr. Joseph T. Beardwood Jr., March 29.

At England General Hospital, Atlantic City, N. J.: Chemotherapy (Sulfonamide and Penicillin), Dr. Hobart A. Reimann, February 22; Yellow Fever, Dr. William D. Sawitz, March 7; Low Back Pain, Dr. Paul C. Colonna, March 21.

OFFICE OF WAR INFORMATION INAUGURATES
SHORT WAVE RADIO BROADCASTS
TO OVERSEAS AUDIENCES

The Office of War Information inaugurated the first of a series of short wave radio broadcasts to overseas audiences by prominent American medical and public health authorities on January 31. Dr. Thomas Parran, Washington, Surgeon General of the U. S. Public Health Service, was the first speaker. The series is entitled "Health Is on the March" and will describe recent medical and health advances made in the United States and other United Nations. Those who will be featured on succeeding programs are Dr. James E. Paullin, Atlanta, Ga., President of the American Medical Association; Dr. Herbert Edwards, New York, director of the Bureau of Tuberculosis, New York City Department of Health; Dr. Selman A. Waksman, New Brunswick, N. J., microbiologist, New Jersey Agricultural Experiment Station, and professor of microbiology at Rutgers College; Dr. Henry E. Meleney, New York, professor of preventive medicine, New York University School of Medicine; Dr. L. T. Coggeshall, Ann Arbor, Mich., chairman, Department of Tropical Medicine, University of Michigan Medical School; Dr. Henry E. Sigerist, Baltimore, professor and director of the Institute of the History of Medicine, Johns Hopkins University, and Dr. Theodore Rosenthal, New York, director of the Bureau of Social Hygiene, New York City Department of Health. Although the talks will be made in English, the Office of War Information Overseas Branch will broadcast translated versions in many languages.

DR. JAMES A. CRABTREE APPOINTED ACTING
CHIEF OF THE HEALTH DIVISION
OF UNRRA

Herbert H. Lehman, Director General of the United Nations Relief and Rehabilitation Administration, recently announced the appointment of Dr. James A. Crabtree as acting chief of the Health division of UNRRA. Dr. Crabtree graduated from the University of Tennessee School of Medicine, Memphis, in 1925 and took postgraduate work in public health at Johns Hopkins University School of Hygiene and Public Health, Baltimore. He was associated with the Tennessee Department of Public Health until 1934, when he became assistant director of health and safety for the Tennessee Valley Authority. Since 1938 Dr. Crabtree has been in the Commissioned Corps of the U. S. Public Health Service. In June 1940 he became executive assistant to the Surgeon General, U. S. Public Health Service and from March 1941 to April 1943 was assigned to the Office of Defense Health and Welfare Services as executive secretary of the Health and Medical Committee, serving also from July 1942 to April 1943 as medical consultant to the Office of Lend-Lease Administration. He has served as chief medical officer of the Office of Foreign Relief and Rehabilitation Operations since April 1, 1943.

MEETING DEVOTED TO SCRUB TYPHUS

The monthly meeting at Walter Reed General Hospital, Washington, D. C., held January 21, was devoted to scrub typhus. In November 1940 the War Department and Navy Department organized the United States of America Typhus Commission. Some of the members of this commission have recently returned to this country from the Pacific theater. Dr. Francis G. Blake, who was to have read a paper at this meeting, was ill at the Walter Reed General Hospital with malaria, probably contracted while on this mission. Lieut. Col. J. F. Sadusk, also a member of this commission, discussed the clinical features of scrub typhus in Dr. Blake's absence. Dr. Kenneth F. Maxcy, another member of the commission, discussed the epidemiology. Drs. R. E. Dyer and Norman Topping, and Capt. E. G. Hakensson, U.S.N., took part in the discussion that followed the papers. Major Gen. Norman T. Kirk, Surgeon General of the Army, opened the meeting with a brief talk, and Col. Stanhope Bayne-Jones, director of the United States of America Typhus Commission, introduced the speakers.

ORGANIZATION SECTION

OFFICIAL NOTES

MEETING OF THE COMMITTEE ON POSTWAR MEDICAL SERVICE

The Committee on Postwar Medical Service met in Washington, D. C., on Jan. 14, 1944. There were present:

Dr. Roger I. Lee, Chairman	
Dr. Arthur W. Allen	Dr. W. F. Ossenfort (U. S.
Dr. Francis G. Blake	P. H. S.)
Commander Edward L. Bortz	Dr. W. W. Palmer
(Navy)	Dr. James E. Paullin
Dr. Fred A. Collier	Dr. George Morris Piersol
Captain W. E. Eaton (Navy)	Brigadier General Fred Rankin
Dr. Morris Fishbein	(Army)
Dr. Alan Gregg	Dr. H. H. Shoulders
Dr. Charles M. Griffith (Veterans Bureau)	

After the minutes of the previous meeting were approved, reports from subcommittees were presented, as follows:

The Report of the Subcommittee on Postwar Location and Relocation (Gregg, Piersol and Allen) was presented by Dr. Gregg. "Location" and "relocation" were defined. Physicians in military service who previous to the war had never been in private practice or held a salaried position as a physician will be seeking location: they will be looking either for private practice (general or specialized) or for a salaried position (general or specialized). Physicians in military service who previous to the war were in private practice or in a salaried position as a physician may on discharge be looking for relocation, which means a change of locality or a change of type of practice or both.

The main opinions reported by Dr. Gregg were: The longer the war lasts or the more rapid the demobilization procedure, the greater will be the number of physicians needing assistance in location or relocation. By so much as hospitals can be encouraged to increase the number of their interns, assistant residents and residents and thus create places for returning physicians for a period of adjustment and training, by so much can nearly all aspects of location and relocation be made easier. An obvious opportunity for the American Medical Association exists in providing a clearinghouse of information regarding professional openings, without assuming, however, the responsibilities or services of an employment bureau. Since a wider and more appropriate distribution of hospital and diagnostic facilities would influence decisively a satisfactory location or relocation of physicians in the postwar period, the Subcommittee on Location and Relocation, with Drs. Griffith and Ossenfort as added members, was authorized to explore the subject of hospital and diagnostic facilities and the extension thereof as an effective measure in the better distribution of medical care.

After a general discussion it was voted that the committee recommend to the Board of Trustees of the American Medical Association that the board look into the desirability of establishing an agency for disseminating information on the location or relocation of physicians in the postwar period.

The report of the Subcommittee on Interns, Residents and Special Training (Drs. Palmer, Blake and Collier) was presented by Dr. Palmer. Up to date the work of the committee had been more or less exploratory. The first, and an important, consideration was that many different committees throughout the country are "planning" in this field: individual hospitals, medical schools, county and state societies as well as the American Medical Association and special societies, particularly the national specialty societies, and to these should be added the Council on Medical Education and Hospitals and the Association of American Medical Colleges. The need of coordination—avoidance of duplication and confusion—is great. The best method of coping with the problem seemed to be through the establishing of a close relation with the Council on Medical Education and Hospitals.

The chairman reported that he had written to twelve of his friends at the head of medical clinics in teaching hospitals for information concerning any plans under consideration. All were in agreement that enlarged facilities would be needed to continue the training of men who were unable to finish a reasonably normal period as intern and as resident before entering military service. In general, hospitals should provide for their own men. Should large numbers of men who had their internship in the smaller nonteaching hospitals make a drive on the teaching hospitals, the situation is likely to become hopeless. Probably relatively few men will desire or need more time to complete their internship. Many will have had experience in hospitals which to a large extent will make up for any lack before service. In any event, the number of interns has been reduced in the individual hospitals at the insistence of the Procurement and Assignment Service. The expansion back to the old number can be made by taking on men who return and who wish for more training as interns. It is anticipated that the greatest demand will be in the resident and special training groups. There is general agreement among the physicians, thus far canvassed that enlarging the resident staff, making greater use of the outpatient departments, adding extern residents and sharing the opportunities between the recently graduated interns and men returning from service will be about the best that can be offered. Also the use of fellowships to a limited extent will provide the necessary training. Obviously, any such program will require subsidy. One of the large foundations has already made a handsome contribution to the postwar training problem. It is hoped that others will follow the example.

The subject of sending a questionnaire to physicians in the armed forces was discussed, and the committee of Drs. Abell, West and Mason was authorized to proceed with the sending out of a sample, or pilot, questionnaire of 3,000 copies, and it was agreed that a note of this procedure should appear in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION. The purpose of the pilot questionnaire is to determine the best form of inquiry as to the probable nature of postwar needs of large numbers of physicians now in military and governmental service.

DOCTORS AT WAR

Radio broadcasts of Doctors at War by the American Medical Association in cooperation with the National Broadcasting Company and the Medical Departments of the United States Army and the United States Navy are on the air each Saturday at 4:30 p. m. Eastern war time (3:30 Central war time, 2:30 Mountain war time and 1:30 Pacific war time).

The titles and guest speakers for the next three programs are as follows:

- February 12. "You Must Help Win This War."
Speaker, Harold A. Vonachen, medical director, Caterpillar Tractor Company, Peoria, Ill.
- February 19. "Hometown Heroes."
Speaker, James A. Paullin, M.D., President, American Medical Association.
- February 26. "Share and Share Alike."
Speaker, Col. Rohland A. Isker, Q. M. C., U. S. Army, Subsistence Research Laboratory, Chicago.

THE CHICAGO SESSION

Seventh Exhibition by American Physicians' Art Association at Hotel Stevens

The American Physicians' Art Association will hold its seventh art exhibition in the gallery of the Hotel Stevens Ball Room June 12 to 16 during the annual session of the American Medical Association. Through the efforts of Mead Johnson and Company the balcony of the immense ballroom of this world

famous hotel has been secured to use as an art gallery with its 500 feet of wall space.

All physicians who do art work, whether beginners or seasoned artists, are invited to participate in this exhibition. There will be over one hundred trophies awarded to four classes of artists from beginners to those who have followed this avocation for over eight years, and any physician who submits an art piece that has merit is quite certain to receive a prize.

The association with the aid of Mead Johnson and Company has arranged so that the submitting of art pieces will entail very little expense. Hanging fees are waived; expressage to and from the show is paid by the association. New members only are required to pay dues of two dollars.

Application blanks, entry blanks and any other information may be obtained from the secretary of the association, F. H. Redewill, M.D., 526 Flood Building, San Francisco.

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Change in Status.—H. R. 2985 has been reported to the House by the Committee on the Judiciary, with the recommendation that it pass. This bill provides for the garnishment, execution or trustee process of wages and salaries of civil officers and employees of the United States.

Bills Introduced.—The President has transmitted to Congress a supplemental estimate of appropriation for the Veterans' Administration for the fiscal year 1944, amounting to \$30,000,000 (H. Doc. 391). This amount, it is contemplated, will be used to provide 9,252 additional hospital beds for neuropsychiatric patients. S. 1683, introduced by Senator Thomas, Utah, proposes to codify the laws relating to the Public Health Service. It is a companion bill to H. R. 3379, introduced by Representative Bulwinkle, North Carolina. S. 1690, introduced by Senator Johnson, Colorado, proposes further to amend the Pay Readjustment Act of 1942, and its enactment will permit the counting of service in the Medical Reserve Corps for pay purposes.

R. 4119, introduced by Representative Lane, Massachusetts, proposes an appropriation of \$1,500,000 to construct a veterans' hospital in Lawrence, Mass., to accommodate approximately 2,000 bed patients.

DISTRICT OF COLUMBIA

Changes in Status.—S. 1340 has been reported to the Senate, establishing a sanitary code governing the operation of restaurants in the District of Columbia. S. 1546 has been reported to the Senate, amending the law relating to the incorporation of Providence Hospital. The primary purpose of this bill, according to the committee report, is to permit the hospital to own property in excess of the \$150,000 limitation contained in the act of incorporation. It also authorizes the hospital to conduct a school for the education and training of nurses and interns with full power to examine the nurses and interns and to issue suitable certificates evidencing completion of their courses of training. H. R. 2644 has been reported to the House with the recommendation that it pass, granting additional powers to the commissioners of the District of Columbia. Among other things, the commissioners are to be authorized to provide for the waiver of payment by any person in the military service of the United States of any annual or other periodic fee required by the law to be paid to the District of Columbia or to any District of Columbia board or commission as a condition to retaining or renewing any license or permit to engage in any business or calling or to practice any profession in the District of Columbia.

STATE MEDICAL LEGISLATION

Kentucky

Bills Introduced.—S. 86, to amend the narcotic drug act, proposes to omit those provisions of the present law which state specifically that the act is not to apply (1) to the sale of a preparation containing not more than $\frac{1}{4}$ grain of morphine or $\frac{1}{8}$ grain of heroin if not more than 1 ounce of such preparation is sold to any one person in any forty-eight consecutive hours, or (2) the sale of ointments or liniments containing narcotic drugs that are susceptible of external use only. H. 147 proposes to authorize the establishment and operation by the state

of six tuberculosis sanatoriums. H. 217 proposes that whenever the county judge of a county which has established a county department of health determines that there is an absolute necessity that a physician attend a person who is unable to pay for such services, or whenever an accident occurs and no physician is available in the immediate vicinity, the judge may by written order direct the county health officer to perform such emergency services as are reasonably necessary. H. 223 proposes to require every person infected with a venereal disease immediately on acquiring knowledge of such infection to apply to a public health unit or, if none is available, to a private physician, for treatment for the disease, and to continue to take treatment thereafter until the prescribed course of treatment is completed.

Mississippi

Bills Introduced.—S. 82 and H. 215 propose to establish a state charity hospital and nurses' home in north Mississippi, to be known as the North Mississippi State Charity Hospital and Nurses' Home and to be located in or near the city of Holly Springs, Marshall County. The hospital is to be of sufficient size to care for not less than 60 bed patients and not more than 100 bed patients. S. 84 proposes so to amend the uniform narcotic drug act as to include isonipecaïne as a narcotic drug within the meaning of the act and to define isonipecaïne as "the substance identified chemically as 1-methyl-4-phenyl-piperidine-4-carboxylic acid ethyl ester, or any salt thereof by whatever trade name identified." S. 87 proposes to condition the issuance of a license to marry on the presentation by each party to the proposed marriage of a physician's certificate that a physical examination was made of the applicant within ten days immediately preceding the date of the application to marry and that the examination did not reveal the presence of any venereal or other contagious disease. S. 91, to amend the privileged communication act, proposes that all communications made to a physician or a surgeon by a patient under his charge or by one seeking professional advice shall be privileged, and that the physician shall not be required to disclose the same in any legal proceeding, except at the instance of the patient or, in case of the death of the patient, by his personal representative, or legal heirs in case there is no personal representative. H. 163 proposes to authorize the establishment and maintenance of state charity hospitals in Jackson in the northeastern part of the state and in the delta section.

New York

Bills Introduced.—S. 371, to amend the laws relating to the practice of medicine, proposes that any licensed physician who enters into military service subsequent to July 1, 1940 and prior to July 1, 1945 within three months after the termination of military service by honorable discharge shall be entitled to a renewal license without examination, reexamination, fine or penalty, notwithstanding the fact that his license or last previous renewal license shall have theretofore expired. S. 409 proposes to provide for a system of compulsory health insurance. A. 505 proposes to enact a separate optical dispensing practice act and to create a state board of examiners in optical dispensing, which is defined as the compounding and dispensing of lenses, spectacles, eye glasses, optical devices or other optical appliances to the intended wearer thereof on the written prescription of a licensed physician or optometrist.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CONNECTICUT

Russell H. Chittenden Prize.—The late Dr. Russell Henry Chittenden, emeritus director of the Sheffield Scientific School of Yale University, New Haven, bequeathed his scientific library to the university and, in addition, a trust fund of \$3,000 the income of which is to be used for a prize to be known as the Russell H. Chittenden Prize. The award will be presented at commencement to the member of the graduating class who stands highest in his class at the Sheffield Scientific School.

Personal.—Dr. Frank B. Converse, West Willington, president of the Tolland County Medical Association, was honored at a recent meeting of the association in recognition of his completion of fifty years in the practice of medicine.—Robert C. Challman, Ph.D., was recently appointed provisional director of psychologic laboratories, Norwich State Hospital, Norwich, succeeding Karl Florian Heiser, Ph.D., who has been appointed research director for the state public welfare council.

Compounds Isolated from Tubercle Bacillus Given to Yale.—A permanent collection of 300 chemical compounds isolated from the tubercle bacillus, said to be the only collection in existence, was presented to Yale University by the National Tuberculosis Association on February 3. The collection, which is the result of seventeen years of research by Rudolph J. Anderson, Ph.D., professor of chemistry, Yale University, New Haven, and his associates, was presented by Dr. Lewis J. Moorman, Oklahoma City, president of the tuberculosis association, and was accepted by Charles Seymour, LL.D., president of Yale. Dr. William Charles White, Washington, D. C., chairman of the committee on medical research of the tuberculosis association, spoke on the work of his committee, which initiated the research in 1926 and which has supported the work since that time. He characterizes the collection as "material found nowhere else in the history of man." According to an announcement, the work of Dr. Anderson and his associates has had unusual value, since many of the substances isolated have opened up a whole new field in the knowledge of chemistry, and many of them are to be found only in the tubercle bacillus in minute quantities.

GEORGIA

Associate Dean Named to Emory.—Dr. Robert Morris Paty of the Bibb Manufacturing Company, Porterdale, has been appointed associate dean at Emory University School of Medicine and medical director of Emory University Hospital, Atlanta. A newspaper report stated that Dr. Paty will have responsibility for the supervision of the first two years of medical work offered on the campus, enabling Dr. Russell H. Oppenheimer, dean of the medical school, to devote his time principally to the work of upper classmen at Grady Hospital. Dr. Paty, who graduated at Emory in 1923, was in charge of a hospital at Changchow, China, from 1925 to 1940.

ILLINOIS

Penicillin Available for Ophthalmia in Newborn.—Twenty million units of penicillin has been made available to the Illinois State Department of Public Health by the National Research Council to use on a research basis for the treatment of newborn babies with ophthalmia. Although the silver nitrate law for the protection of babies' eyes has made ophthalmia rare in Illinois, about 30 newborn infants are hospitalized at state expense each year to prevent blindness from a type of ophthalmia that is contracted at birth from mothers infected with a venereal disease, the state health department reported. The 20 million units of penicillin which has been made available to the department is enough to treat 30 infants, it was stated.

Chicago

The Kretschmer Lecture.—Dr. Russell L. Haden, Cleveland Clinic, Cleveland, will deliver the third Edwin R. Kretschmer Memorial Lecture on April 28 at the Palmer House. His subject will be "The Varying Clinical Picture of Leukemia."

Symposium on Antibiotic Agents.—The Chicago Section of the American Chemical Society will conduct a symposium on antibiotic agents at the Medinah Club of Chicago, February 24. Selman A. Waksman, Ph.D., microbiologist, New Jersey State

Agricultural Experiment Station, New Brunswick, will discuss "Production and Nature of Antibiotic Substances," and Dr. Wallace E. Herrell of the Mayo Clinic, Rochester, Minn., "Clinical Experience with Antibiotic Agents."

Meeting of Bacteriologists.—The Society of Illinois Bacteriologists held its winter meeting at the Chicago Illini Union, February 11. The speakers at the meeting included Dr. Charles Phillip Miller on "An Institutional Survey of Meningococcus Carriers"; Miss Frances Friewer, Illinois Department of Public Health Laboratories, "The Salmonella Problem in Illinois: The Identification of Types and Their Distribution," and Edward J. Czarnetzky, Ph.D., Research and Technical Department, Wilson and Company, "Bacteriologic Problems of the Meat Packing Industry."

LOUISIANA

Special Society Election.—At the recent meeting of the southern section of the American Federation for Clinical Research in New Orleans Drs. Alfred W. Harris, Dallas, was chosen president; John S. Harter, Jackson, Miss., vice president and Charles T. Ashworth, Dallas, secretary-treasurer. The 1944 section meeting will be held in Dallas.

MASSACHUSETTS

Personal.—Dr. Walter B. Cannon, professor emeritus of physiology, Harvard Medical School, Boston, has been appointed visiting professor of physiology at the New York University College of Medicine.

District Society to Observe One Hundred and Fiftieth Anniversary.—The Worcester District Medical Society plans to observe its one hundred and fiftieth anniversary at a special celebration May 10. According to the *Worcester Medical News* a group of physicians met in Worcester in 1794 to organize the Worcester Medical Society. It states that a medical association had been formed in the county in 1784, of which Dr. Samuel Prentice was secretary. No records apparently are available for this first group. The organization became the district society in 1804.

MICHIGAN

Student Award.—At the recent commencement of Wayne University College of Medicine, Detroit, the Theodore A. McGraw Award, a scholarship given to the outstanding student in the junior class, was presented to Donald E. Preshaw.

Psychiatrists Devote Meetings to War Problems.—Dr. Raymond W. Waggoner, professor of psychiatry, University of Michigan Medical School, Ann Arbor, and psychiatric consultant to the Selective Service System, addressed the Michigan Society of Neurology and Psychiatry, January 20, on "Selection, Rejection, Rehabilitation: Our Psychiatric Responsibilities." The society has been devoting recent meetings to a discussion of war problems, one session having been addressed by Dr. John C. Whitehorn, Henry Phipps professor of psychiatry, Johns Hopkins University School of Medicine, Baltimore, on "Individual Issues in Postmilitary Psychotherapy" and another by Dr. Walter S. Maclay, medical superintendent of the Mill Hill Emergency Hospital, London, "Neurotic Disabilities in a Total War: The Rehabilitation of Neurosis Cases."

MINNESOTA

Foundation Lectures.—Harland G. Wood, Ph.D., Minneapolis, winner of the Eli Lilly and Company Research Award for 1942, gave an exchange lecture at the Mayo Foundation House, Rochester, February 4, on "The Fixation of Carbon Dioxide by Bacteria and Animals."—Lieut. Col. Loyal Davis, M. C., A. U. S., gave a Mayo Foundation Lecture, February 4, on "Recent Experiences with Russian Military Medicine."

Waseca County Accredited for Tuberculosis.—Waseca County was recently accredited for the control of human tuberculosis, receiving its award from the Minnesota Department of Health and the Minnesota State Medical Association during special ceremonies in the public high school in Waseca. Waseca County is the eighth county in the state to receive this award for meeting the requirements for accreditation for the control of human tuberculosis.

MISSISSIPPI

Personal.—Dr. Clyde M. Speck was to resign, January 1, as medical superintendent of the Mississippi State Hospital, Whitfield, to enter private practice. Dr. Luther L. McDougal, Booneville, has been appointed superintendent of the hospital to succeed Dr. Speck.—Dr. William A. Dodson Jr., Gulfport, has been appointed acting director of the Harrison County Health Department.

NEW YORK

Postgraduate Lectures.—The Tompkins County Medical Society will be addressed in Ithaca, February 15, by Dr. L. Maxwell Lockie, Buffalo, on "The Management of Arthritis, Acute and Chronic." On April 18 Dr. Byron D. Bowen, Buffalo, will discuss "The Management of Diabetes with the Newer Forms of Insulin" and May 16 Dr. Abraham H. Aaron, Buffalo, "Evaluation of the Common Drugs Used in General Practice." The Jefferson County Medical Society was addressed in Watertown, February 10, by Dr. Albert F. R. Andresen, Brooklyn, on "Interpretation of Gastrointestinal Symptoms." Dr. Andresen also gave the same lecture before the St. Lawrence County Medical Society in Potsdam on the same day. All the lectures are part of a postgraduate series sponsored by the state medical society and the state department of health.

Medical Societies Advised to Act on "Kickback" Cases.—Herman T. Stichman, Moreland act commissioner, is reported to have issued a warning that the commission may recommend that jurisdictional and disciplinary powers vested in state and county medical societies may be taken from them because of their failure to take "prompt action against physicians charged with giving or receiving 'kickbacks'" in workmen's compensation cases, according to the *New York World-Telegram*, January 24. Mr. Stichman's remarks were addressed to Dr. David J. Kaliski, chairman of the compensation boards of the societies, who was called before the commission when it resumed its investigation into abuses of the workmen's compensation law. According to the *World-Telegram*, Dr. Kaliski protested that the task of deciding cases of doctors charged with abuses of the law would be "too big for any organization if it is suddenly confronted with hundreds of such cases." He added that some cases cited in the inquiry already had been investigated by his boards. He said that medical societies were "as interested in seeing the correction of abuses" as the commission.

New York City

Personal.—Drs. Alan Gregg and Porter J. Crawford of the Rockefeller Foundation recently went to Nassau, Bahamas, to consult with the Duke of Windsor on a plan to build a modern hospital there.—Dr. Francis G. Riley, Jamaica, has resigned as chairman of the board of trustees of the Medical Society of the County of Queens, closing a period of twenty years of consecutive service with the society, in which he has held most of the important offices, including the presidency.

Dr. Kidd Named Professor of Pathology.—Dr. John G. Kidd, associate member of the Rockefeller Institute for Medical Research, has been appointed professor of pathology at Cornell University Medical College and pathologist at the New York Hospital. Dr. Kidd graduated at Johns Hopkins University School of Medicine, Baltimore, in 1932. In 1939 he received the Eli Lilly Research Award in bacteriology and immunology for original work on animal tumors of virus etiology.

Portrait of Dr. Woll.—A portrait of Frederic A. Woll, Ph.D., chairman of the department of hygiene of the College of the City of New York, was unveiled and presented to the college, January 29. Executed by Clayton Braun, the portrait is a gift of Dr. Woll's associates in the department of hygiene. Dr. Woll, who will be retired at the end of the college year in June because of the statutory age limit, first joined the City College in 1907 as a teacher of health and physical education. He has been professor and chairman of the department of hygiene since 1927.

Symposium on the Heart.—The New York Heart Association, a division of the New York Tuberculosis and Health Association, was addressed February 1, among others, at the New York Academy of Medicine by Drs. Ward J. MacNeal and Charles A. Poindexter on "Arrest of Endocarditis by Penicillin"; Col. John T. King, M. C., A. U. S., "Heart Disorders in an Army General Hospital," and Dr. Robert L. Levy, "The Diagnosis of Cardiovascular Diseases in Registrants for Military Service: Observations Based on the Reexamination of 5,000 Rejectees."

Meeting on Diabetes.—The New York Diabetes Association will be addressed at a meeting in the New York Academy of Medicine, February 19, by Drs. Joseph H. Barach, Pittsburgh, and Joseph T. Beardwood Jr., Philadelphia, on "Normal Standards in the Treatment of Young Diabetics" and "Report on the Philadelphia Diabetes Survey" respectively. The meeting will conclude with a round table discussion on diabetes, participating speakers to include Drs. Cecil Striker, Cincinnati; Seale Harris, Birmingham, Ala.; J. West Mitchell, Pittsburgh; Elliott P. Joslin and Howard F. Root, Boston, and Edward S. Dillon, Philadelphia.

Illegal Practitioner Sentenced.—The state education department reports that Bertha Hess (or Hesse) was sentenced, Dec. 21, 1943, in the court of special sessions of the City of New York, Bronx County, to pay a fine of \$100 or serve thirty days in the workhouse and, in addition, to serve three months in the workhouse, the workhouse sentence being suspended during good behavior. The woman was arrested on Nov. 22, 1943 in New York on a charge of unlawfully practicing medicine. It is reported that she had been "treating her patients by massage, baths, diet and teas for conditions which included arthritis, acne, pains in the back, and in the case of eye conditions she applied wet pads soaked in tea to the eyes as well as prescribing diet, teas and giving massage. Her usual examination consisted of taking the pulse and examining the eyes with a magnifying glass, although in some cases she also pressed upon the spine or the region complained of with her fingers."

Promotions Among Health Personnel.—The New York City Department of Health announces the following promotions among health officer personnel to the health and teaching centers of the department: Dr. Michael Antell, former health officer of the Richmond Health Center and Borough Office, to the Washington Heights Health and Teaching Center; Dr. Eugene O. Chimene, Jackson Heights, N. Y., former health officer of the Flushing-Corona Health District, Queens, to the East Harlem Health and Teaching Center; Dr. Harold H. Mitchell, Long Island, N. Y., former health officer of the Astoria-Long Island City Health District, to the Lower East Side Health and Teaching Center; Dr. Jerome S. Peterson, former health officer of the Central Harlem District, to the Red Hook Health and Teaching Center, Brooklyn. Dr. Herbert R. Edwards, director of the department's bureau of tuberculosis, will continue to devote part of his time as health officer of the Kips Bay-Yorkville Health and Teaching Center.

OKLAHOMA

Personal.—Dr. Albert W. Roth, Tulsa, was recently elected an honorary member of the Tulsa County Medical Society.—Dr. Finis W. Ewing, Muskogee, has been appointed a member of the state board of medical examiners to succeed the late Dr. Calvin E. Bradley, Tulsa.

Changes in Licensure.—The Oklahoma State Board of Medical Examiners at a meeting, December 28-29, took the following actions:

- Dr. Gappa M. Rushing, Durant, license revoked.
- Dr. Esley Elwood Lawson, Medford, license suspended.
- Dr. William Thomas Nunn, Ross, placed on probation for one year.
- Dr. Henry John Nelson, Pasadena, Texas, formerly of Mangum, license reinstated, but narcotic dispensing privileges denied to him.
- Dr. Clarence Andrew Griffin, Idabel, license reinstated, but narcotic dispensing privileges denied to him.
- Dr. Paul William Gutsche, Hazard, license restored.

PENNSYLVANIA

Personal.—Dr. Henry F. Adams, North East, has been named medical director of Erie County.—Dr. Daniel M. Replogle, Altoona, has been appointed coroner of Blair County.

Philadelphia

Course in Public Health Administration.—The department of public health and preventive medicine of the University of Pennsylvania School of Medicine will open a course on public health administration, February 15, for persons who wish to become more familiar with administrative practices in this field and especially for graduates in medicine who are working or desire to work for the master of public health degree. The course will continue until June 15.

Creation of Mental Health Division Recommended.—At a meeting of the board of directors of the Philadelphia County Medical Society, January 12, a recommendation of the committee on nervous diseases and mental hygiene, urging the establishment of a division of mental health in the Philadelphia Department of Public Health, was approved. The recommendation, as adopted by the society, carries the endorsement of the society and suggests that psychiatric consultants be utilized at teachers' institutes and similar meetings to acquaint educational authorities with the problem of mental illness, that courses in mental hygiene be incorporated into the curriculum of schools, the courses to be taught by psychiatrists rather than by teachers superficially acquainted with psychiatric principles, and that psychiatrists be included among the medical examiners of the present school medical system so that they may act in an advisory capacity in behavior and disciplinary problems which may indicate the onset of mental illness. The recommendations further urged that the men of the community rejected at induction centers because of psychoneuroses and other nervous and mental conditions should be directed to adequate rehabilitative

treatment to assist the average general practitioner in recognizing minor mental illnesses. The committee recommends the arrangement of a course in the practical management of the psychoneuroses to be given to those members of the society who may be interested.

Retirements at Temple University.—Dr. Wilbur Emory Burnett, formerly professor of clinical surgery at Temple University School of Medicine, has been appointed professor of surgery to succeed Dr. William Wayne Babcock. Dr. Babcock, who is one of a group to be retired for age, will become professor emeritus. Other new appointees named to succeed physicians in the retired group include:

Dr. Thomas Harold Davis to succeed Dr. Robert F. Ridpath, professor of laryngology and rhinology.

Dr. John Franklin Huber to succeed Dr. John B. Roxby, professor of anatomy.

Dr. Robert H. Hamilton Jr. to succeed Dr. Melvin A. Saylor, professor of physiologic chemistry.

Dr. Morton J. Oppenheimer to succeed Dr. Joseph G. Hickey, professor of physiology.

Dr. Lowrain E. McCrea to succeed Dr. William Hershey Thomas, professor of urology.

Other physicians who are being retired are Drs. Harriet L. Hartley, professor of preventive medicine, hygiene and public health, Harry A. Duncan, clinical professor of gynecology, Howard G. Fretz, clinical professor of urology, Daniel J. Donnelly, assistant professor of medicine, Henry C. Groff, associate professor of medicine, and Joseph Wesley Anders, associate in laryngology and rhinology. New appointments to the faculty include those of Dr. Esther M. Greisheimer, professor of physiology, Woman's Medical College of Pennsylvania, to professor of physiology, Donald L. Kimmel, Ph.D., assistant professor of anatomy, Baylor University College of Medicine, Houston, to associate professor of anatomy, and Clement A. Fox, Ph.D., associate in neurology, Northwestern University School of Medicine, to associate professor of anatomy.

UTAH

Industrial Health Symposium.—The industrial health committee of the Utah State Medical Association sponsored a symposium at the Newhouse Hotel, Salt Lake City, January 19. The speakers were:

O. A. Wiesley, Salt Lake City, Workmen's Compensation.

Dr. John L. Jones, Salt Lake City, State Industrial Hygiene Service.

Dr. Paul S. Richards, Bingham Canyon, The Industrial Clinic.

Dr. Maxwell M. Wintrobe, Baltimore, Nutrition in Industry Under Rationing.

Major William B. Fulton, M. R. C., Preventive Medicine in Industry.

Major John E. L. Keyes, M. C., A. U. S., Ophthalmology in Industry.

Dr. Leroy U. Gardner, Saranac Lake, N. Y., Diseases of the Chest in Industry.

Dr. George W. Wright, Trudeau, N. Y., Disabilities in Silicosis.

Lieut. Col. Samuel G. Peck, M. R. C., Industrial Dermatitis.

WASHINGTON

Personal.—Dr. Asahel J. Hockett, New Orleans, has been appointed superintendent of the King County Hospital, Seattle. He has been serving as superintendent and medical administrator of the Touro Infirmary, New Orleans.

Society News.—Dr. Joel W. Baker, Seattle, presented "A Review of General Surgery with Particular Reference to Differential Diagnosis at the Operating Table and Choice of Surgical Procedures" before the Walla Walla Valley Medical Society recently. Others on the program were Lieut. Col. John D. Lamon Jr. and Capt. Gerhard Dancilius, M. R. C.

Honorary Members Named.—The Washington State Medical Association has announced that honorary memberships have been granted to Drs. Earl M. Carney, Jay T. Dowling, Albert B. Kidd, Charles E. McClure, Donald A. Nicholson, Herbert C. Ostrom, Richard W. Perry, Lorenzo L. Stephens and Philip V. Von Phul, all of Seattle; Charles L. Dixon, Renton; Warner M. Karshner, Puyallup; Thomas B. Curran, Charles R. McCreery and William B. McCreery, all of Tacoma, and Emil M. Welty and William E. Abrams, both of Spokane. The McCreery physicians are twins. They were born on Nov. 14, 1874, were graduated at the University of Minnesota Medical School, Minneapolis, in 1902 and licensed to practice in Washington in 1903. In 1906 they were elected to membership in the Pierce County Medical Society and the state medical association.

WISCONSIN

Building Named for Dr. Caples.—The former Waukesha Springs Sanitarium will henceforth be known as Caples Hall in accordance with action taken by the board of trustees of Carroll College, Waukesha, to honor Dr. Byron M. Caples, who established the sanatorium in 1898 and who operated it until its recent sale to Carroll College (THE JOURNAL, Aug. 28, 1943, p. 1261).

GENERAL

Special Society Election.—A recent mail ballot of the American Roentgen Ray Society resulted in the election of the following officers: Drs. Lyell C. Kinney, San Diego, Calif., president-elect; Paul C. Hodges, Chicago, and Major Aubrey O. Hampton, M. C., A. U. S., vice presidents; H. Dabney Kerr, Iowa City, secretary; James Bennett Edwards, Leonia, N. J., treasurer, and Dr. Ramsay Spillman, New York, historian. Dr. Sherwood Moore, St. Louis, will be president for the coming year.

Warning on Mineral Water to Relieve Rheumatism.—A report has been received that orders are being taken by the Rutherford Laboratories, Post Office Box 143, Westwood, N. J., for "Canada Mineral Water," which, it is said, is being sold to relieve rheumatism. One check for \$5 was cashed by "Dr. Henzling." Inquiries directed to the laboratories are said to bring no response. The Bureau of Investigation of the American Medical Association does not have a record of the Rutherford Laboratories or of "Canada Mineral Water." Neither is it able to identify the "Dr. Henzling" reputed to be connected with the firm.

Physician's Documents Missing.—Dr. Carl S. J. Tillmanns, Los Angeles, announced that the following documents have disappeared from his office:

Diploma, Washington University School of Medicine, St. Louis, issued in 1907; the document now missing is a duplicate.

California license C 1440 of 1919, also a duplicate.

Illinois State license of 1907.

Missouri State license of 1907.

Iowa State license of 1908.

North Dakota State license of 1914.

Dr. Tillmanns announces that in 1934 his name was changed from Charles to Carl, and the California book of licenses records it as "Carl or Charles."

Grants for Research on Sex and Reproduction.—Applications to the committee for research in problems of sex, National Research Council, for financial aid during the fiscal year beginning July 1, in support of work on fundamental problems of sex and reproduction, should be received before April 1. They may be addressed to the chairman, Robert M. Yerkes, Ph.D., Yale University School of Medicine, New Haven 11, Conn. Although endocrine investigations continue to command the interest and support of the committee, preference, in accordance with current policy, will ordinarily be given to proposals for the investigation of neurologic, psychobiologic and behavioral problems of sex and reproduction.

Dentists Hold War Session.—The war service committee of the American Dental Association will meet at the Palmer House, Chicago, February 19, with Capt. C. Raymond Wells (DC), U. S. Naval Reserve, president of the American Dental Association, presenting the opening address. Other speakers will include:

Edward C. Elliott, LL.D., president, Purdue University, Lafayette, Ind., The Present Status of the Army and Navy Specialized Training Program, and Probable Effect on Future Dental Service to the Civilian Population Under Present War Manpower and Selective Service Regulations and Policies.

Warren F. Draper, acting surgeon general, U. S. P. H. S., Civilian Health in World War I and Now.

The meeting will also include symposiums on "Service Rendered by the American Dental Association in This Crisis to the Armed Forces and Civilian Practice" and "Dental Instruments, Equipment and Supplies."

American Orthopsychiatric Association.—The twenty-first annual meeting of the American Orthopsychiatric Association will be held at the Palmer House, Chicago, February 17-19. Discussions will be devoted to the origin of group prejudices, mental health in the military services, group therapy, experimentation on movement frustration and aggression, clinical studies, prophylaxis and rehabilitation in wartime, preventive aspects of orthopsychiatry and problems of therapy and management. Among the speakers will be Drs. Henry C. Schumacher, Cleveland; Leonard Rosenzweig, North Warren, Pa.; Lawson G. Lowrey, New York; David M. Levy, New York; Karl A. Menninger, Topeka, Kan.; George S. Stevenson, New York; Thomas A. C. Rennie, New York; George H. Preston, Baltimore; Edith B. Jackson, New Haven, Conn.; Hyman S. Lippman, St. Paul, and S. Spafford Ackerly, Louisville, Ky.

CANADA

New Professor of Clinical Medicine.—Dr. George K. Wharton, London, Ont., has been appointed professor of clinical medicine at Queen's University Faculty of Medicine at Kingston. Dr. Wharton was a fellow in medicine at the Mayo Foundation, Rochester, Minn., from January 1929 to January 1932. He received the degree of M.S. in medicine from the University of Minnesota in 1931.

Physical Therapy School Opened at McGill.—A school for training physical therapy technicians has been opened at McGill University under the Faculty of Medicine, Montreal. Dr. Guy H. Fisk, medical director of the school of physical therapy, is director of the course and Miss M. Finley chief instructress. The entrance requirements are senior matriculation or its equivalent, and the course is of two years' duration with an additional six months' hospital work. A university diploma will be granted at the completion of the course. Graduates are eligible for membership in the Canadian Physiotherapy Association.

LATIN AMERICA

Health Activities in Latin America.—The national government of Brazil and the Institute of Inter-American Affairs have agreed to cooperate in a health and sanitation program over a period of five years, beginning January 1. The national government will contribute 5 million dollars and the institute 3 million dollars to finance the program. The new agreement assures the continuation of health and sanitation work in the Amazon and Rio Doce valleys of Brazil, which are being developed as sources of strategic materials. The funds will enable the organization, built up in the last two years for the Amazon and Rio Doce work, to carry on numerous projects for malaria control, building of hospitals, health centers and dispensaries and the training of nurses and other personnel. In Mexico a similar agreement was set up between the institute and the national government, the 5 million dollar cost to be shared by the government and the institute.

Extend Facilities for School of Public Health.—In December arrangements were completed by the Inter-American Cooperative Health Service to expand the present facilities of the school of public health in Mexico by financing the purchase of equipment and supplies and by supplementing salaries in order to build up a full time faculty. The plan will assist in developing a course in public health and preventive medicine in accordance with principles approved by the committee on hygiene of the League of Nations, by the American Public Health Association and by the Office of the Pan American Sanitary Bureau. No tuition will be charged to physicians studying at the school under the auspices of the Institute of Inter-American Affairs or of any of the service of the various countries in which cooperative programs of health are in operation. The course will run forty weeks, ending November 18, and will be divided into four trimesters, allowing ten weeks each for introductory subjects, basic subjects, special courses and practical field training. Tentatively it has been decided to limit the enrolment to fifty students, twenty to twenty-five from Mexico and twenty-five to thirty from other Central and South American countries.

Leprosy Survey.—A survey just completed by federal health authorities indicates that Mexico probably has a leprosy population of about 21,000. The study, conducted over a nine year period, is part of a national drive against the disease and revealed 7,000 cases under control of the National Prophylactic Service Against Leprosy and, in addition, 10,929 patients who are either suspected of being contaminated or who are regarded as potential victims. The report states that, since the disease takes a heavy toll in rural regions, the actual incidence is thought to be several times the number of cases reported. The largest concentration of the leprosy was uncovered in the states of Guanajuato, Jalisco, Michoacan, Sinaloa, and the Federal District. The most vulnerable group are men between 30 and 39. Few children were found infected and not a single person with leprosy was discovered under the age of 5.

Malaria Control.—In the Dominican Republic a malaria control project was to be launched at San Cristobal during December. In Panama two malaria control drainage jobs were completed in Capira during September.

New Construction.—The Institute of Tropical Medicine at Belem, Brazil, was completed during August, and fifty beds are available. Hospitals are under construction under the Amazon project at Santarem and Rio Branco, Brazil. A new laboratory at Vitoria, Brazil, has been established to provide facilities and information for all field services. In Barranquilla, Colombia, an addition to the children's hospital has been started. A camp school for underprivileged children is nearing completion near Manizales, capital of Caldas, Colombia. In Haiti a health center was completed at Port-au-Prince, similar in design to rural health centers in southwestern cities of the United States.

Latin Americans Acknowledge Cooperation.—A feature of the observance of Independence Day of the Brazilian medical associations was the presentation of a testimonial parchment to President Roosevelt through American Ambassador Caffrey, acknowledging the services rendered by physicians of the United States. The parchment serves as an expression of the feeling

of solidarity by physicians in Brazil to their colleagues in the United States. The testimonial is signed by the presidents of the following groups: National Academy of Medicine, Brazilian Academy of Military Medicine, Brazilian College of Surgeons, Medical Syndicate of Rio de Janeiro, Society of Ex-Interns of Military Hospitals, Brazilian Society of Dermatology and Syphilology, Brazilian Society of Gastroenterology and Nutrition, Brazilian Society of Gynecology and Obstetrics, Brazilian Society of Ophthalmology, Brazilian Society of Pediatrics, Brazilian Society of Tuberculosis and the Brazilian Society of Urology.

Society News.—Dr. Percival Bailey, of the Illinois Neuro-psychiatric Institute, Chicago, gave a series of lectures in Mexico City in January on "Cerebral Tumors in the Child" and "Surgical Indications in Cerebral Tumors." Dr. Bailey was in Mexico at the invitation of Dr. Gustavo Baz, secretary of the federal department of health and public welfare.

FOREIGN

New Group of Otolaryngologists.—The British Association of Otolaryngologists recently formed with Dr. William M. Mollison, London, as president. Other officers are Lionel Colledge, vice president, Victor E. Negus, honorary treasurer and Frank C. Ormerod, honorary secretary, all of London. The temporary address of the association is 22 Upper Wimpole Street, London W. 1.

Child Health Project in China.—The China Aid Council and the American Bureau for Medical Aid to China are cooperating in a child health project to be set up shortly in China. The council has made a grant of \$10,000 for a child health institute and has assisted in making possible a course of training in child guidance which Dr. Chieh Sung and his wife, Dr. Tsui-mei Huang Sung, are taking preparatory to returning to China. They will be sent to China by the American Bureau for Medical Aid to China to participate in work of the national health administration as well as in the proposed health institute.

State Medicine Waning in New Zealand.—A planning committee has been set up in New Zealand to study the problems arising from the program of free national medical service which has now been in existence two years (*THE JOURNAL*, Nov. 22, 1941, p. 1800), newspapers report. The two year old free national medical service in New Zealand is not proving successful, newspaper reports indicated on January 24. War mobilization has left New Zealand short of doctors. In one region in the capital there are 40,000 people without a single practicing physician, it was stated. In numbers of rural areas the only physician has been mobilized and replacement has been difficult. In 2 instances organized workers have declined to continue with their jobs unless physicians are provided, the report continued. According to press reports "Dr. W. Newlands, a former member of the national medical council, recently charged that 'some medical men who cannot be called eminent received \$50,000 each from the social security fund last year.' This figure was said by a government official to be too high, but country doctors generally consider their city colleagues are pulling down handsome incomes for reduced service. Physicians back in New Zealand after years of service with the armed forces have been startled," it was stated. One past president of the medical association is said to have described the situation as "an awful racket." "Since the national health service became free, doctors have been so heavily dated up in their consulting rooms there have been instances of them refusing to visit cases which have proven fatal. Cases cited by Dr. Newlands include three physicians who, he said, were making incomes equivalent to 73 attendances on patients on every day of the year. If a doctor worked ten hours a day, he said, this meant he still had to see seven people an hour exclusive of his traveling time. This situation of overconsultation and markedly higher earnings for diminished service is generally admitted by medical men. It was one of the developments anticipated by the National Medical Association when the free doctor plan was proposed. It has apparently weighed with Prime Minister John Curtin's Australian nonparty committee on medical care which recently reported to the Australian house of representatives that such systems as that in operation in New Zealand 'offered no solution to the problem and were subject to abuses which were very difficult to check.'" Newspaper reports indicated that the physicians feel that a reasonable scheme can be operated only if the political control is avoided and that professional control of the whole field will enable them to check existing abuses which they deplore. The report states that the administration has not yet shown its hand on the question of racketeering in medical fees, reduced standards of care and excessive certification, but it is believed that there have been a number of cases where payment has been refused physicians who have been felt to be giving inferior service.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Jan. 8, 1944.

Drug Control Required as Soon as European Countries Are Free from Axis Control

The two international bodies created under the Dangerous Drugs and Opium Conventions—the Permanent Central Opium Board and the Supervisory Body—have recently concluded meetings in London. The Central Board lays the greatest emphasis on the importance of instituting at the earliest possible moment a complete control, along the lines laid down by the international conventions, over the manufacture and distribution of narcotic drugs in the enemy and enemy occupied countries of Europe as they come under the military or civil control of the United Nations. Unless this is done there is a grave danger of a recrudescence of the illicit traffic in drugs and the spread of drug addiction such as occurred after the war of 1914-1918. Large supplies of the drugs will be required by medical relief organizations in the devastated countries, and their control and distribution will be a matter of the first importance. In the case of countries which have been occupied by the Axis powers, the restoration to full efficiency of the national administrations may take a considerable time. The board suggests that arrangements should be completed without delay with the military authorities who will be in control.

Bill for the Rehabilitation of the Disabled

A disabled persons employment bill, introduced by the government, has received a warm welcome in the House of Commons. For the first time, rehabilitation and resettlement are treated as a single problem, combining medical science and industrial knowledge. The hope inspired in the patient when economic independence by means of his own efforts is offered to him is considered a valuable aid to his recovery. Recently, when prisoners were repatriated from Germany because they were disabled, the Ministry of Labor instructed all its local officers to get in touch with those in their areas with a view to assisting them. Physical therapy and occupational therapy have been introduced into many hospitals with amazing results. The limb fitting specialists working under the auspices of the Ministry of Pensions at centers established for this purpose have achieved remarkable results.

Pulmonary tuberculosis causes a large number of disabilities. The experience of the pioneer village settlement for the tuberculous at Papworth, where the patients work under medical control, has shown how much can be achieved in these cases. For many years the only occupations for the blind were brush making and basket making. Now they follow many occupations, and the war has made new openings for them.

The new bill is based on the principle that disability is a handicap, not a barrier, to employment. Wartime experience has shown that all but a small minority of the disabled can find work. But the government has come to the conclusion that voluntary effort is not enough and that a legal obligation is necessary. As peace has its casualties as well as war, the bill will cover the entire population and is a permanent addition to the country's social services. A register of disabled persons will be set up. The bill imposes an obligation on employers to employ a specific quota of persons registered as disabled. The scheme will include facilities for vocational training. Industry can and should provide much of its own training, but the task will not be left to chance. The bill was welcomed particularly by the labor party. It was thought that men disabled in the war should have priority over civilian casualties.

BRAZIL

(From Our Regular Correspondent)

Jan. 6, 1944.

Variation in Selection of the Primary Causes of Death

It is important medically to ascertain the exact degree of comparability of the statistics of causes of death as registered by the vital statistics bureaus of different countries. Regarding this problem Dr. Lincoln de Freitas of the National Department of Health has recently published a paper on the selection of the primary causes of death in Brazil in which he completes a contribution from Dr. T. A. Janssen of the United States Census Bureau which appeared in 1938 as a special report (Census Bureau, Special Reports on Vital Statistics, Vol. 5, No. 47). In his paper Dr. Janssen studied the degree of agreement in the selection of the primary causes of 1,032 deaths forming a specially organized sample, as classified by the statistical bureaus of eighteen countries (Australia, Belgium, Canada, Ceylon, Denmark, England and Wales, Italy, the Netherlands, New Zealand, Norway, the Philippines, Scotland, South African Union, Spain, Sweden, Switzerland, Turkey and the United States). The fact that Brazil had not been included in Dr. Janssen's study makes the contribution of Dr. de Freitas especially interesting. Translated into Portuguese, the list of 1,032 deaths has been submitted by Dr. de Freitas to the Bureau of Demographic Statistics of the Ministry of the Interior, which is in charge of classifying the deaths registered in the twenty states of Brazil as a whole. The paper here summarized studies with full particulars the degree of agreement between the classification of those deaths by the Brazilian bureau and their classification by the bureaus of the eighteen countries included in Dr. Janssen's study. Not all the countries could classify the 1,032 deaths: England and Wales classified only 874, Belgium 963, the South African Union 978, Spain 1,024, Sweden 1,010, Turkey 1,029 and Switzerland 1,031. All the other countries, including the United States and now Brazil, classified the full 1,032 deaths. In his analysis of the results of the classification by the eighteen countries Dr. Janssen pointed out, as an evidence of great diversity in the principles guiding the selection of the primary cause of death, that in all the groups of causes constituting the several chapters of the International List of Causes of Death the maximum percentage in each group is practically twice as great as the minimum.

Comparison of these percentages with those obtained by the Brazilian classification shows a general agreement; the percentages of the Brazilian classification lie as a rule between the maximum and the minimum, being generally near the average percentages. Significant exceptions are found only in the percentages of deaths from diseases of the nervous system, slightly higher than the observed maximum registered for the eighteen countries, and from diseases of the digestive system, slightly lower than the minimum. The percentage of agreement between the classification of deaths from all causes by the Brazilian bureau and the average of the bureaus of the other eighteen countries was 56.6, the minimum percentage of agreement being 46.7 in the case of Belgium, and the maximum being 65.9 in the case of Italy. The percentage of agreement between the classification by the Brazilian bureau and by that of the United States was 55.1. The agreement between the classification by the Brazilian bureau and the classification by each one of the eighteen countries for deaths from various causes varied rather widely, from the minimum of 13.6 per cent agreement for alcoholism to the maximum percentage of 88.0 for influenza. For the eighteen countries as a whole the minimum percentage of agreement was 43.6 (for the deaths caused by syphilis), and the maximum was 73.6 (for the deaths caused by cancer and other malignant tumors). The lower third of the average percentage of agreement (between 43.6 and 52.1) occurred in the

case of deaths caused by syphilis, anemias, diseases of the mouth and pharynx, circulatory disorders of the brain, diseases of the prostate, alcoholism and meningitis. The median third of the average percentage of agreement (between 53.3 and 56.4) occurred in the case of deaths caused by nephritis, diseases of pregnancy, childbirth and the puerperal state, appendicitis, diseases of the heart, arteriosclerosis, pneumonia, peritonitis, cirrhosis of the liver and diseases of the thyroids and parathyroids. Finally, the upper third of the average percentage of agreement (between 59.1 and 73.6) occurred in the case of deaths caused by diseases of the first year of life, hernia and intestinal obstruction, tuberculosis, peptic ulcers, diabetes, influenza and cancer. Dr. de Freitas studied in particular the degree of agreement of classifications in some important causes of death. This part of his study was summarized by presentation of the average percentage of agreement between the classification by the Brazilian bureau and by that of the eighteen countries as a whole, and also the percentage of agreement with the classification by the United States Census Bureau.

Buenos Aires

(From Our Regular Correspondent)

Jan. 1, 1944.

Medical Lectures

Dr. Carlos Jiménez Díaz, head of the clinical ward of the Faculty of Medicine of Madrid, recently gave four lectures at the Faculty of Medicine of Buenos Aires. In the first lecture, "Nosologic Place of Allergy in Relation to Asthma," he concluded that allergy is a constitutional reaction due to an active, abnormal response of the cells to certain influences. Sensitization of the antigen-antibody type is a special reaction in the development of which climatic, infectious and nervous factors (conditioned reflexes) also are concerned. Dietary allergens, as single factors, produce true sensitization only in rare cases. The latter fact explains the frequent failure of desensitization and deallergization if the general active cellular reaction is not properly controlled. Control of the cellular reaction in the future will put an end to the pessimistic saying that "the one who was born with asthma will die with it," Dr. Jiménez Díaz believes.

Although the diagnosis of typical bronchial asthma offers no difficulty, in view of the numerous clinical varieties of this disease, diagnosis is often not so simple. In the second lecture the speaker also discussed the history of the knowledge of asthma and the relations between asthma, bronchitis, emphysema and pulmonary sclerosis as determined by clinical x-ray and spirometric examinations. The speaker found by studies and clinical experience that the crisis in asthma is caused mainly by changes of the pulmonary circulation in association with interstitial edema, local edema of the mucosa and increased local secretion. Bronchial spasm, expiratory bronchial collapse and the fixed posture of the diaphragm are secondary factors.

In "Asthma of Infectious Origin" Dr. Jiménez Díaz spoke also of the forms and character of nonallergic asthma, especially infectious asthma. This is either primary and acute or secondary to various other diseases, especially chronic diseases of the respiratory tract, pneumonia and neuritis. Desensitization is of no value. The disease may regress or follow either a chronic or an acute course. Severe asthma may develop to progressive collapse or to cyanotic cachexia. Allergic eosinophilic infiltrations and atelectasis of asthmatic pseudopneumonia assume an important role in the development of infectious asthma. Nasal polyps, certain changes of the nasal fossae and diseases of the sinuses are of secondary importance in the development of the disease, in which a constitutional reaction is the main factor. Bacteria produce an allergic reaction of a humoral type which progresses as a hyperergic inflammation.

In a final lecture Dr. Jiménez Díaz discussed clinical and experimental nutritional protein edema. The speaker analyzed

the clinical symptoms and physiopathologic mechanism in the production of edema, in which the diminution of proteins in the blood and qualitative changes of the ratio globulin/albumin in the blood are the main factors. Thinness, low organic resistance and similar conditions are important contributing elements. The speaker also discussed the changes in nutritional edema brought about by forced renutrition and by transfusion of plasma. According to his experimental observations, hypoproteinemia in nutritional edema is not a direct result of a low protein diet, depending primarily on a low calory diet, with consequent increased destruction of proteins. Acute deficiency of proteins in certain organs results in an acute diminution in the production of enzymes by those organs.

Experimental Traumatic Shock

In a recent lecture before the Sociedad Argentina de Biología, with Dr. B. A. Houssay presiding, Dr. V. H. Cicardo said that experiments carried on in the Centro de Investigaciones Fisiológicas of Buenos Aires showed that the arterial pressure of dogs falls immediately after removal of a tourniquet from the leg of an animal previously traumatized or in a condition of ischemia. The shock can be produced in animals which did not have hemorrhages and in which the size of the leg is not increased. The nervous system was found to be secondary in the production of shock, which occurred in the same degree in animals with reflex excitability and in those completely curarized. The passage of a toxic substance from the traumatized or ischemic leg into the blood was verified by the results of crossed circulation. Shock occurred in the recipient dog but not in the traumatized animal. Study of the electrolytes in the blood plasma of the femoral vein and of blood in general circulation showed a constant increase of potassium in the former and a moderate increase in the latter. The amount of potassium in the blood plasma was diminished in comparison to that in the femoral vein because of the fixation of the substance in the tissues and its greater dilution in the former than in the latter. The amount of sodium in local and general plasma was equal. The amount of chlorides in the plasma of the femoral vein was diminished in comparison to that in the blood. Lowered blood pressure and depressed cardiac function exhibited the classic effect of traumatic hyperpotassemia, which was increased by the production of potassium by certain tissues caused by local anoxemia from hypotension, producing shock. When the latter was not acute, the condition of the animal was improved by the administration of calcium.

Psychopathology According to Thomas Aquinas

Dr. E. Eduardo Krapf, Buenos Aires psychiatrist, recently published a book in which he compares the medieval psychiatric and psychopathologic concepts according to Thomas Aquinas (1225-1274) and the modern concepts. Krapf analyzes Thomas Aquinas's book (which is the only source of medieval psychiatry) and draws an interesting parallel between the medieval and modern psychiatric conceptions.

Marriages

NORRIS M. BURLSON, Port Allegany, Pa., to Miss Catherine McMillan of Vass, N. C., January 6.

ERNEST JOSEPH EYTINGE, Redlands, Calif., to Miss Marion Parker Hedges of Brooklyn, January 17.

JOHN FIELDING CRIGLER JR., Charlotte, N. C., to Miss Mary Adele Sippel of Baltimore, January 8.

HILBERT P. JUBELT, Gillespie, Ill., to Miss June Lucile Mathews of Urbana, December 27.

ORIN WATTS BOOTH to Miss Elizabeth Amanda Mack, both of Durham, N. C., December 18.

HARRY A. DAVIS JR., Sumter, S. C., to Miss Alfreda Lytle of Tyrone, Pa., December 31.

Deaths

William George MacCallum ♂ formerly Baxley professor of pathology and director of the department of pathology and bacteriology, Johns Hopkins University School of Medicine, died February 3, aged 69.

Dr. MacCallum, son of a physician, was born in Dunnville, Ontario, April 18, 1874. He graduated at the University of Toronto in 1894 and at Johns Hopkins University School of Medicine in 1897. After an internship at Johns Hopkins Hospital he served as resident pathologist; at the time of his death he was pathologist-in-chief. He joined the teaching faculty at Johns Hopkins in 1899 as assistant in pathology, later serving as associate professor and professor of pathologic physiology and lecturer in forensic medicine. In 1909 Dr. MacCallum went to Columbia University College of Physicians and Surgeons as professor of pathology, serving also as pathologist at the German Hospital and at the Presbyterian Hospital. In 1917 he returned to Johns Hopkins to become professor of pathology and bacteriology, filling the position held by the late Dr. William H. Welch. He served as head of the department until last spring, when he retired. At the time of his death he was a member of the advisory board of the faculty of medicine and a member of various committees at the school.

Dr. MacCallum was a member of the National Academy of Sciences, American Association for the Advancement of Science, Association of American Physicians, the Medical and Chirurgical Faculty of Maryland, the American Medical Association and the Harvey Society, of which he was president in 1914. He was a fellow of the New York Academy of Medicine and an honorary fellow of the Royal Society of Medicine. In 1909 he was president of the International Association of Medical Museums.

Dr. MacCallum had contributed much to the scientific side of medicine. As early as 1897 with Opie he demonstrated the sexual conjugation of parasites of avian malaria. He was one of the first to show that the presumable source of pancreatic glycosuria is in the islands of Langerhans. Valuable observations were noted in his later research on rheumatism, filtrable viruses, cirrhosis of the liver and the pathology of pneumonia following influenza. His work with Voegtlin on the parathyroids was notable. Dr. MacCallum's numerous contributions to medical literature reflected the wide range of his research. His "Textbook on Pathology," first published in 1916, is of value to the teacher and student. He also wrote a "Biography of W. S. Halsted."

James Grassick, Grand Forks, N. D.; Rush Medical College, Chicago, 1885; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1888; also a pharmacist; member of the House of Delegates of the American Medical Association in 1913; formerly a director of the National Tuberculosis Association; historian, member and in 1924 president of the North Dakota State Medical Association; a founder, charter member, first president and later president emeritus, North Dakota Anti-Tuberculosis Association; Camp Grassick, resort for undernourished children on Lake Isabel near Dawson, was named for him; superintendent, state board of health from 1907 to 1912; for many years university physician at the University of North Dakota and special lecturer at the school of medicine; served on the staffs of the North Dakota Deaconess and St. Michael's hospitals; author of "North Dakota Medicine—Sketches and Abstracts," the "Paisley Shawl," "Doctor Luke" and others; director of the First National Bank at Buxton and the Northwestern Bank; vice president of the Northwestern Trust Company; died December 19, aged 93, of influenza and pneumonia.

Van Albert Stilley ♂ Benton, Ky.; University of Louisville Medical Department, 1890; president of the Kentucky State Medical Association; for a period chairman of the committee on public instruction and legislation and for twenty-one years councilor for the first district of the state medical association; secretary of the Marshall County Medical Society from 1900 to 1905 and president in 1906; secretary of the Southwestern Kentucky Medical Association from 1901 to 1907 and served as president in 1908; health officer of Marshall County from 1893 to 1924; field director and public health consultant for the state department of health in western Kentucky for fifteen years; in 1939, after the McCracken County Health Department dedicated new headquarters in Paducah to him, honoring his long years of service in the field of public health in western Kentucky, his photomural and a bronze plaque bearing the dedicatory inscription were hung in the building; served as president of the Bank of Benton; died in the Illinois Central Hospital, Paducah, January 20, aged 77.

William Salant, New York; Columbia University College of Physicians and Surgeons, New York, 1899; Fellow at the Rockefeller Institute from 1901 to 1907; chief, pharmacologic laboratory, bureau of chemistry, U. S. Department of Agriculture, from 1908 to 1918; formerly acting professor of physiologic chemistry at the University of Wisconsin, Madison; professor of physiology and pharmacology at the University of Georgia Medical Department, Augusta, from 1919 to 1929; in charge of pharmacologic investigations, Coldspring Harbor, N. Y., from 1929 to 1932; guest professor of pharmacology at the New York Homeopathic Medical College and Flower Hospital in 1935; member of the American Society for Pharmacology and Experimental Therapeutics, American Physiological Society, American Society of Biological Chemists, Society for Experimental Biology and Medicine and the Harvey Society; fellow of the American Association for the Advancement of Science; died December 10, aged 73, of heart disease.

Lee Cohen ♂ Baltimore; University of Maryland School of Medicine, Baltimore, 1895; specialist certified by the American Board of Otolaryngology and the American Board of Plastic Surgery; member of the American Laryngological, Rhinological and Otolological Society; fellow of the American College of Surgeons; in charge of oral plastic surgery at General Army Hospital number 11, Cape May, N. J., during World War I; on the staffs of the Baltimore Eye, Ear and Throat Charity Hospital and the Mount Sinai Hospital; died in the Johns Hopkins Hospital December 31, aged 69, of carcinoma of the bladder.

Giles Waldo Thomas, New York; Harvard Medical School, Boston, 1928; member of the Medical Society of the State of New York and the American Psychiatric Association; research associate, department of psychiatry, Columbia University College of Physicians and Surgeons; diplomate of the National Board of Medical Examiners; on the staff of the Presbyterian Hospital; appointed a captain in the medical corps, Army of the United States, on May 23, 1942; assigned to Station Hospital, Fort Devens, Mass.; honorably discharged Aug. 10, 1943 because of physical disqualification; died January 12, aged 42.

Thomas Collins Denny, Des Moines; Jefferson Medical College of Philadelphia, 1912; member of the Iowa State Medical Society; served the Central Life Assurance Society in various capacities, holding the presidency from 1927 to 1932; formerly medical director of the Iowa Emergency Relief Administration; president of the chamber of commerce in 1933; presented with the Des Moines *Tribune's* Community Service Award for 1934 for his services to civic and community enterprises over a period of several years; died in the Mercy Hospital December 22, aged 56, of coronary thrombosis.

William Isler Wooten, Greenville, N. C.; Jefferson Medical College of Philadelphia, 1920; member of the Medical Society of the State of North Carolina; past president of the Pitt County Medical Society; fellow of the American College of Surgeons; served as a member of the State House of Representatives; a member of the Pitt County Board of Health; a director of the Guaranty Bank and Trust Company; member of the Rotary Club; medical superintendent and associate surgeon, Pitt General Hospital; died December 12, aged 49, of coronary occlusion.

Herman Emil Albrecht ♂ Philadelphia; University of Pennsylvania School of Medicine, Philadelphia, 1911; served during World War I; on the staff of the Presbyterian Hospital; died December 30, aged 56, of angina pectoris.

Louis Peter Alf, Piqua, Ohio; Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin, Prussia, 1878; died December 24, aged 91, of congestive heart disease and hypertension.

Bion Pemberton Allen ♂ Oriskany, N. Y.; University of Pennsylvania Department of Medicine, Philadelphia, 1893; died in December, aged 77, of pneumonia.

Allen B. Anderson, Pawnee City, Neb.; Louisville (Ky.) Medical College, 1877; past president of the Nebraska State Medical Association; member of the House of Delegates of the American Medical Association in 1903; for many years pension examiner; died December 27, aged 92, of shock following fracture of femur received in a fall.

Adolph A. Aucoin, Plattenville, La.; Medical Department of Tulane University of Louisiana, New Orleans, 1884; member of the Louisiana State Medical Society; also a pharmacist; at various times a member of the school board of Assumption Parish; died December 18, aged 81, of influenza.

Wilmot Ayres, Beverly Hills, Calif.; Jefferson Medical College of Philadelphia, 1910; assistant surgeon in the medical department of the Pacific Electric Railway, Los Angeles; on

the staff of the California Hospital, Los Angeles; died in St. Vincent's Hospital, Los Angeles, December 23, aged 61, of carcinoma of the floor of the mouth.

Gordon Henry Bahlman, Flint, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1913; member of the Michigan State Medical Society; served during World War I; medical coordinator of civilian defense; past president of the Rotary Club; on the staffs of the St. Joseph Hospital, Women's Hospital and the Hurley Hospital, where he died December 23, aged 56, of virus pneumonia.

Floyd William Bennett Jr., St. Louis; St. Louis University School of Medicine, 1937; died suddenly, December 26, aged 33, of heart disease.

Pierce G. Blanchard * Appling, Ga.; University of Georgia Medical Department, Augusta, 1911; died in the University Hospital, Augusta, recently, aged 55.

Stephen Henry Brown, Columbia, La.; Louisville (Ky.) Medical College, 1897; served as coroner of Caldwell Parish; died November 15, aged 70, of lobar pneumonia.

Lila Owen Baker Burbank, East Liverpool, Ohio; Tufts College Medical School, Boston, 1903; served with the Massachusetts Department of Health; died November 19, aged 73, of diabetes mellitus.

Preston O. Carrico, Ashmore, Ill.; Medical College of Indiana, Indianapolis, 1891; died December 31, aged 81, of asthma and heart disease.

Olen Edgar Chenoweth, Lima, Ohio; Starling Medical College, Columbus, 1903; at one time secretary of the Allen County Medical Society; served during World War I; died December 19, aged 64, of injuries received when he fell down the stairs.

Charles Hiram Churchill, Albuquerque, N. M.; Rush Medical College, Chicago, 1886; died December 29, aged 85, of carcinoma.

Philip James Clark * Fond du Lac, Wis.; University of Wisconsin Medical School, Madison, 1938; on the staff of St. Agnes Hospital; died in Phoenix, Ariz.; December 29, aged 30, of cerebral hemorrhage.

Frank French Clifford, Rochester, Minn.; State University of Iowa College of Medicine, Iowa City, 1885; at various times served as mayor, member of the village council, member of the board of education and as postmaster of West Concord; died in the Colonial Hospital December 30, aged 80, of cardiac decompensation.

Joseph Franklin Cook * Louisville, Ky.; Louisville and Hospital Medical College, 1908; on the staffs of the SS Mary and Elizabeth Hospital, Kentucky Baptist Hospital and the Norton Memorial Infirmary; died December 24, aged 67, of injuries received when he was struck by a truck as he was crossing the street.

Justus H. Cooley, North Plainfield, N. J.; Eclectic Medical College of the City of New York, 1884; at one time mayor of North Plainfield and for many years a member of the board of education; served as school physician of Warren township; died December 31, aged 91, of pneumonia.

James Albert Craig, Greenwood, Ind.; Medical College of Indiana, Indianapolis, 1894; member of the Indiana State Medical Association; died December 25, aged 72, of cerebral hemorrhage.

Robert Bruce Dibble, Pueblo, Colo.; Indiana Medical College, School of Medicine of Purdue University, Indianapolis, 1906; formerly coroner of Pueblo County; died December 29, aged 69, of arteriosclerosis.

Edgar Dale Downing * Denver; Cooper Medical College, San Francisco, 1911; formerly vice president of the Colorado State Medical Society; member of the Colorado State Board of Examiners in the Basic Sciences; died in Albuquerque, N. M., December 30, aged 56, of acute lobar pneumonia.

Thomas B. Duke, Littlefield, Texas (licensed in Texas under the Act of 1907); member of the State Medical Association of Texas; veteran of the Spanish-American War; served as county health officer; on the staff of the Littlefield Hospital and Clinic; died December 6, aged 68, of cardiorenal disease.

Harry Fisk Hutchinson * Forestville, N. Y.; University of Buffalo School of Medicine, 1902; health officer and school physician; on the staff of the Brooks Memorial Hospital, Dunkirk, where he died December 17, aged 70, of encephalitis following influenza.

George Washington Kelly, Carlton, Ga.; Atlanta College of Physicians and Surgeons, 1911; member of the Medical Association of Georgia; served during World War I; died recently, aged 53, of cerebral hemorrhage.

Eugene Kerr, Baltimore; University of Maryland School of Medicine, Baltimore, 1905; died November 21, aged 72.

Willard Wallace Lemaire * Worcester, Mass.; University of Vermont College of Medicine, Burlington, 1902; served during World War I; died December 27, aged 64, of influenza, pneumonia and coronary thrombosis.

Wallace Isaac Longstreth, Kansas City, Mo.; St. Louis College of Physicians and Surgeons, 1909; member of the Missouri State Medical Association; served during World War I; lieutenant colonel, medical reserve corps, U. S. Army, not on active duty; at one time associated with the Indian Service; on the staff of the Veterans Administration Facility, Excelsior Springs, where he died November 8, aged 64, of cerebral thrombosis with hemiplegia.

Donn Hamilton Montgomery, Denver; St. Louis College of Physicians and Surgeons, 1919; died recently, aged 54, of gas bacillus septicemia.

Otto Neustätter, Baltimore; Ludwig-Maximilians-Universität Medizinische Fakultät, Munich, Bavaria, Germany, 1894; at one time scientific director of the Zentrale fuer Gesundheitsdienst der Lebensversicherung of Germany; in 1911 in charge of a division of the International Exhibition of Hygiene in Dresden and collaborator with Professor Sudhoff in the publication of a catalogue on the historical section of the exhibition; emergency committee in aid of displaced foreign physicians fellow in history of medicine, Johns Hopkins University School of Medicine; died December 23, aged 73, of pneumonia.

James Ennis Parramore, Tahlequah, Okla.; Memphis (Tenn.) Hospital Medical College, 1913; medical officer, World War I; died November 13, aged 58, of coronary occlusion.

Emory Albert Powell, Cleveland; Starling Medical College, Columbus, 1895; served on the staff of St. Alexis Hospital; died December 21, aged 80, of coronary thrombosis.

Donald Crane Prentiss, Astoria, Ore.; University of Oregon Medical School, Portland, 1938; acting part time Clatsop County health officer; pathologist, St. Mary's Hospital; died in the Providence Hospital, Portland, December 4, aged 30, of subacute bacterial endocarditis.

Louis Preschel * New York; Long Island College Hospital, Brooklyn, 1916; associate chief otolaryngologist, Stuyvesant Polyclinic; died in the Montefiore Hospital December 16, aged 52, of hypertension.

Millard Reid Purnell, Shreveport, La.; Memphis (Tenn.) Hospital Medical College, 1891; member of the Louisiana State Medical Society; a medical examiner for the city induction center; died in the Schumpert Sanitarium December 6, aged 74, of carcinoma of the bladder.

Ernest Shurly Ramsdell, University of Pennsylvania Department of Medicine, 1895; served on the staffs of the Cooper Hospital, Camden, N. J., and the University and Children's hospitals; died December 6, aged 72, of heart disease.

Ernest Paul Rauch, Lancaster, Ohio; Ohio Medical University, Columbus, 1898; died November 20, aged 66, of coronary occlusion.

Glanville Yeisley Rusk * San Francisco; Johns Hopkins University School of Medicine, Baltimore, 1900; member of the American Association of Pathologists and Bacteriologists; professor of pathology at the University of California Medical School; formerly on the staff of the New York Pathological Institute, New York; on the staff of Mount Zion Hospital; died November 22, aged 68.

William T. Sherman, Crown Point, N. Y.; Bellevue Hospital Medical College, New York, 1890; member of the Medical Society of the State of New York; served on the staff of the Moses-Ludington Hospital, Ticonderoga; died in Port Henry December 9, aged 78, of senility.

Isabelle Thompson Smart, New York; New York Medical College and Hospital for Women, New York, 1904; at one time supervisor of the city elementary schools; died December 10, aged 74, of pneumonia.

John Franklin Spencer, Norwood, Ohio; Eclectic Medical Institute, Cincinnati, 1903; died recently, aged 80, of hypertensive heart disease.

Fred E. Steele, Waterbury, Vt.; the Hahnemann Medical College and Hospital, Chicago, 1882; member of the Vermont State Medical Society; past president of the Washington County Medical Society; at one time a member of the state house of representatives and senator; served on the staff of the Vermont State Hospital for the Insane; a charter member of the Montpelier Rotary Club; died December 9, aged 84, of senility.

Francis J. Sullivan, Kankakee, Ill.; Rush Medical College, Chicago, 1897; member of the Illinois State Medical Society; served in the medical corps of the U. S. Army during World War I; senior physician, Kankakee State Hospital; died December 16, aged 66, of cerebral hemorrhage.

Arthur Peter Thompson ☉ Maywood, Calif.; State University of Iowa College of Medicine, Iowa City, 1910; served during World War I; died in a Los Angeles hospital November 10, aged 57, of cerebral hemorrhage.

Alton G. Warner, New York; New York Homeopathic Medical College, New York, 1883; fellow of the American College of Surgeons; formerly on the staffs of the Cumberland Street, Peck Memorial and Prospect Heights hospitals, Brooklyn; died in the Flower and Fifth Avenue Hospitals, December 27, aged 85, of cerebral hemorrhage.

Robert H. Waterford, Chicago (licensed in Oklahoma under the Act of 1908, in Tennessee and Arkansas, years unknown); died December 23, aged 82, of bronchopneumonia and uremia.

Louis Emil Wedel, East St. Louis, Ill.; Barnes Medical College, St. Louis, 1909; member of the Illinois State Medical Society; Spanish-American War veteran; for many years president and member of the public library board; died in the Veterans Administration Facility, Jefferson Barracks, Mo., December 16, aged 64, of heart disease.

Carl Weidner Sr., Louisville, Ky.; Kentucky School of Medicine, Louisville, 1881; member of the Kentucky State Medical Association; also a pharmacist; professor emeritus of hygiene and preventive medicine at the University of Louisville School of Medicine; died December 15, aged 86, of cardiovascular renal disease.

Nettie Weintraub ☉ Kingston, N. Y.; Woman's Medical College of Pennsylvania, Philadelphia, 1934; on the staff of Benedictine Hospital; died in the Ulster County Tuberculosis Hospital December 9, aged 41, of pulmonary tuberculosis and caseous pneumonia.

Adolph Weizenhoffer, Miami Beach, Fla.; Columbia University College of Physicians and Surgeons, New York, 1906; died in St. Francis Hospital December 11, aged 65, of virus pneumonia, exposure and paralysis agitans.

Sara Welt ☉ New York; Universität Zürich Medizinische Fakultät, Switzerland, 1885; served on the staff of the Mount Sinai Hospital, where she died December 26, aged 83, of bronchopneumonia.

William Sholly Wentzel ☉ Sunbury, Pa.; Medico-Chirurgical College of Philadelphia, 1912; served as a member of the Northumberland County local draft board number 3 and as a member of the procurement and assignment board of Northumberland and Snyder counties; on the staff of the Mary M. Packer Hospital; died December 1, aged 54, of cerebral hemorrhage.

William Fleming Willien, Indianapolis; Medical College of Indiana, Indianapolis, 1898; served in the medical corps of the U. S. Army during World War I; at one time on the staff of St. Anthony's Hospital, Terre Haute, Ind.; on the staff of the Veterans Administration Facility, where he died December 14, aged 69, of bronchopneumonia.

Harlan Elrod Wilson ☉ Passed Assistant Surgeon, U. S. Public Health Service, Staten Island, N. Y.; State University of Iowa College of Medicine, Iowa City, 1938; formerly chief medical officer, Federal Correctional Institution, Texarkana, Texas, and on the staff of the U. S. Penitentiary Hospital, Leavenworth, Kan.; died in the New York Hospital December 5, aged 30, of brain tumor.

John Albert Wilson, Columbus, Ohio; Ohio Medical University, Columbus, 1898; died December 5, aged 74, of pneumonia.

Charles Wilmer Wirts ☉ Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1900; served during World War I; on the associate staff, St. John's General Hospital, where he died December 15, aged 70, of primary atypical pneumonitis and chronic myocarditis.

Elizabeth A. Woodworth ☉ Minneapolis; Minneapolis College of Physicians and Surgeons, medical department of Hamline University, 1901; member of the Society of American Bacteriologists; bacteriologist, city department of health, from 1913 to 1934 and connected with the department since 1901; died in St. Mary's Hospital December 15, aged 79, of carcinoma of the colon.

Andrew R. Wyatt, Fort Wayne, Ind.; Physio-Medical College of Indiana, Indianapolis, 1881; honorary member of the Indiana State Medical Association and the Fort Wayne

Medical Society; past president and secretary of the La Grange County Medical Society; formerly health commissioner of La Grange County; at one time a member of the school board of La Grange and a member of the library board; a member of the draft board during World War I; on the staff of the Lutheran Hospital; died December 19, aged 88, of pneumonia.

Richard T. Yoe, Louisville, Ky.; Hospital College of Medicine, Louisville, 1885; member of the Kentucky State Medical Association; served during World War I; died in St. Joseph Infirmary December 6, aged 82, of bronchopneumonia and uremia.

Frederic Berg Zandt, Hamilton Square, N. J.; Medico-Chirurgical College of Philadelphia, 1899; member of the Medical Society of New Jersey; head of local draft board number 4; on the staff of the William McKinley Memorial Hospital, Trenton; past president of the Lions Club; died in St. Francis Hospital, Trenton, December 10, aged 65, of influenza and pneumonia.

Charles Zimmermann, Milwaukee; Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin, Prussia, Germany, 1880; member of the State Medical Society of Wisconsin; fellow of the American College of Surgeons; died in Grand Rapids, Mich., December 7, aged 87, of chronic myocarditis and chronic bronchitis.

DIED WHILE IN MILITARY SERVICE

Roy Edwin Ahrens, St. Louis; Washington University School of Medicine, St. Louis, 1941; first lieutenant, medical corps, Army of the United States; died in a Raleigh, N. C., hospital December 13, aged 28, of injuries received in an automobile accident.

Irving Blazar ☉ Providence, R. I.; Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin, Prussia, 1937; commissioned a first lieutenant in the medical corps, Army of the United States on Nov. 26, 1943; died in Carlisle Barracks, Pa., December 20, aged 33, of coronary occlusion.

James Peyton Dean ☉ Assistant Surgeon, Lieutenant (jg), U. S. Navy, Chattanooga, Tenn.; University of Tennessee College of Medicine, Memphis, 1941; diplomate of the National Board of Medical Examiners; entered the service of the U. S. Navy on Jan. 9, 1942; a flight surgeon in the Naval Air Corps; died near Rio de Janeiro, Brazil, November 19, aged 28, in an airplane crash.

James Alexander Givan, Worcester, Mass.; Tufts College Medical School, Boston, 1922; member of the Massachusetts Medical Society, Boston Orthopedic Club and the American Academy of Orthopaedic Surgeons; fellow of the American College of Surgeons; councilor of Tufts Medical Alumni Association and past president of Tufts Alumni of Worcester County; assistant orthopedic surgeon, Worcester City Hospital; commissioned a lieutenant commander in the medical corps of the U. S. Naval Reserve on Sept. 16, 1942; chief of the orthopedic staff at the U. S. Naval Hospital, Naval Operating Base, Norfolk, Va., where he died November 14, aged 44, of coronary thrombosis.

Rowland William Hall Jr., Clinton, Miss.; University of Arkansas School of Medicine, Little Rock, 1939; member of the Mississippi State Medical Association; first lieutenant, medical corps, Army of the United States; died in London, England, November 4, aged 35, of appendical abscess.

Walter Ovid McCammon, New Orleans; Tulane University of Louisiana School of Medicine, New Orleans, 1935; member of the Kentucky State Medical Association; formerly health officer of Washington County, Ky.; entered the medical corps, Army of the United States, as a first lieutenant on June 15, 1942; promoted to captain; a flight surgeon in the Air Corps; died in Sicily November 14, aged 32, of infarction myocardium.

Gustavus Winzow Thomasson Jr., Dallas, Texas; Tulane University of Louisiana School of Medicine, New Orleans, 1936; member of the State Medical Association of Texas; commissioned a captain in the medical corps, Army of the United States, on March 26, 1942 and later promoted to a major; a member of the Air Corps stationed at Childress Air Training and Bombardier School at Childress; killed in Floyd County September 23, aged 31, in an airplane accident.

Bureau of Investigation

MISBRANDED PRODUCTS

Abstracts of Notices of Judgment Issued by the
Food and Drug Administration of the
Federal Security Agency

[EDITORIAL NOTE.—These Notices of Judgment are issued under the Food, Drug and Cosmetic Act and in cases in which they refer to drugs and devices they are designated D. D. N. J. and foods, F. N. J. The abstracts that follow are given in the briefest possible form: (1) the name of the product; (2) the name of the manufacturer, shipper or consigner; (3) the date of shipment; (4) the composition; (5) the type of nostrum; (6) the reason for the charge of misbranding, and (7) the date of issuance of the Notice of Judgment—which is considerably later than the date of the seizure of the product and somewhat later than the conclusion of the case by the Food and Drug Administration.]

Bleything Concentrated Vegetable Compounds.—These included "Formula No. 201-A" and "Formula No. 201-B." Bleything Laboratories, Los Angeles. Shipped between Jan. 4 and May 4, 1941. Composition: the No. 201-A consisted of tablets weighing approximately 8 grains each and containing dried plant material yielding less than 1 grain of total mineral constituents; the No. 201-B tablets had the same weight and contained dried plant material yielding less than 1½ grains of total mineral constituents. The first-named product was represented in labeling to supply something which would combat excessive acidity and the second-named to supply minerals which ward off alkalinity. These representations were false and misleading since the articles could not be relied on by physicians and were not effective for the purposes stated. Hence the products were misbranded.—[D. D. N. J., F. D. C. 632; February 1943.] Also misbranded under provisions of the law applicable to foods as reported in F. N. J. No. 3424.

Besak's Horke Vino.—Gold Seal Manufacturing Company, Scranton, Pa. Shipped Sept. 4 and Dec. 3, 1941. Composition: essentially small amounts of aloin and strychnine, with alcohol and water. Misbranded because directions on label were inadequate, since this was a laxative preparation. Also misbranded because label statements, "Nature's Tonic . . . This Tonic has been found a valuable aid in cases of Indigestion, Dyspepsia . . . Nervousness, General Debility, and in other derangements of the digestive organs" and ". . . labeled to conform to requirements of New Federal Food, Drug and Cosmetic Law, which is effective June 25th, 1939" were false and misleading, since product was not a tonic, did not possess natural tonic properties bestowed by nature, was not a valuable aid in cases of indigestion, nervousness, general debility and other derangements of the digestive organs, was not labeled to conform to the requirements of the law, and label did not declare the presence and quantity of strychnine present.—[D. D. N. J., F. D. C. 661; February 1943.]

Drigneault's Eau de Quinine Hair Tonic.—Joseph Daigneault, Malone, N. Y. Shipped June 3, 1940. Composition: essentially alcohol (59 per cent), water and small amounts of quinine, perfume and coloring matter. Misbranded because of false and misleading statement on label, "prevents falling out and promotes growth of hair," and because label did not accurately declare quantity of contents or correct name and address of manufacturer, packer or distributor.—[D. D. N. J., F. D. C. 679; February 1943.]

Effervescent Kruschen Salts.—Johnstone Drug Sales Corporation, Rochester, N. Y. Shipped April 23, 1941. Composition: essentially anhydrous epsom salt (18.7 per cent) with small amounts of common salt (sodium chloride), potassium chloride, sodium sulfate, potassium sulfate, sodium bicarbonate and citric acid. Misbranded because statements in circular accompanying package gave the false impression that the product was an effective agent for reducing weight, stimulating the liver and bowels and acting as a mild diuretic.—[D. D. N. J., F. D. C. 634; February 1943.]

Hicks' Quinine Hair Tonic.—J. A. Hicks, Jacksonville, Fla. Shipped June 2, 1941. Composition: essentially alcohol (about 61 per cent by volume), salicylic acid (approximately 0.9 per cent), quinine sulfate, water and perfume. Misbranded because label falsely represented this as effective for eczema, alopecia, dandruff and itching scalp and definitely claimed that it would promote the growth of the hair. Further misbranded because label failed to bear an accurate statement of the quantity of contents and the common or usual names of the active ingredients.—[D. D. N. J., F. D. C. 643; February 1943.]

Joint-Ense.—Pope Laboratories, Hallowell, Maine. Shipped Oct. 23, 1940. Composition: essentially salicylic acid and volatile oils, including eucalyptol, camphor, menthol, methyl salicylate and turpentine oil, incorporated in petrolatum. Misbranded because various statements in the labeling and the designs showing portions of the human anatomy represented that the product would be efficacious in treating joint diseases, would ease joints, relieve minor joint aches and pains, muscular lame-

ness, strained muscles, stiff neck and all surface muscular aches and pains and also those affecting the neck, shoulders, elbows, fingers, knees and feet, and would provide a competent treatment for irritations or discomforts due to common colds in nose, throat and chest. These representations were declared false and misleading.—[D. D. N. J., F. D. C. 635; February 1943.]

Magozone.—Eastern American Association for Oxygen Therapy, Bloomfield, N. J. Shipped April 17, 1941. Composition: essentially magnesium oxide and peroxide. Misbranded because labeling represented that the product would liberate ozone, eliminate the cause of diseases, restore healthy blood and repair damage; would be efficacious in all ailments due to constipation and faulty assimilation metabolism and elimination which result in gradual poisoning of the system as well as those due to other poisonings of the body; that it was a general purifier for many ailments including gas and poisoning; that it had value in the treatment of nausea, gas in stomach or intestines, headache, dizziness, biliousness and pressure on the heart; that it would be effective in treating diarrhea and ulceration of the digestive tract; that it would purify the blood and lymph vessels and organs; that it would prevent development of parasites, eliminate the causes of disease and restore lost health. Misbranding was further charged in the misrepresentation that another product, namely, "Calozone," would be efficacious in correcting running bowels and treating pus or mucous formation.—[D. D. N. J., F. D. C. 637; February 1943.]

Nichol's Long Life For Health.—James B. Nichols, trading as J. B. Nichols and Sons and Nichols Chemical Company, Memphis, Tenn. Shipped Nov. 12, 1940. Composition: plant drugs (unnamed), alcohol (13 per cent by volume) and water. Misbranded in that label falsely represented that it would be efficacious to prolong life, maintain health, treat chest colds, nervousness, weakness, and all cold conditions of the system that cause consumption; that it consisted of two or more ingredients and label did not list their common or usual names or the quantity, kind and proportion of alcohol present; that it was in package form and did not bear label giving name and place of business of the manufacturer, packer or distributor, or accurate statement of quantity of contents in terms of measure, and that container was so made, formed or filled as to be misleading.—[D. D. N. J., F. D. C. 661; February 1943.]

Polly Rich Wheat Germ.—Colonial Milling Company, Nashville, Tenn. Shipped between Sept. 15 and 24, 1941. Composition not given. Misbranded because of the following false representations in labeling: that it contains vitamins A, B, E and G; that four level tablespoons of the product contain about the average daily requirement of vitamin B; that it is "nature's own tonic in its pure virgin wholeness . . . the heart or embryo of the grain of wheat is known as 'Wheat Germ.' . . . It contains iron, phosphorus, sodium, potassium, zinc, copper, manganese, calcium and magnesium, all of which are essential to our mineral economy, in forms which are easily assimilated." Further misbranded because falsely represented as efficacious in treating a wide variety of bodily disorders, such as secondary anemia, cataracts, sterility and alcoholic diseases.—[D. D. N. J., F. D. C. 641; February 1943.] Further misbranded under provisions of the law applicable to foods as reported in F. N. J. No. 3222.

Respirine.—Albert Laboratories, Inc., Chicago. Shipped prior to July 14, 1941. Composition: essentially sugar, water, ammonium chloride, ammonium carbonate, potassium nitrate and alkaloidal plant drugs, including atropine and emodin-bearing drugs. Misbranded because label falsely claimed that the product was highly efficient in alleviating wheezing, sniffing, choking, coughing spells and other respiratory irritations and would relieve "misery" resulting from such symptoms as coryza, asthma, bronchitis, hay fever and choking attacks. Further misbranded because label failed to declare the quantity or proportion of belladonna alkaloids present.—[D. D. N. J., F. D. C. 644; February 1943.]

Sant6.—Dr. W. B. Caldwell, Inc., Monticello, Ill. Shipped Feb. 12, 1941. Composition: an alcoholic solution containing in each fluid ounce an iron compound representing approximately 150 milligrams of iron and 800 U. S. P. units of vitamin B₁. Misbranded because labeling falsely represented that this was an appropriate treatment for nutritional anemia due to dietary deficiencies or for pale, underweight women with poor appetite; would help the system recover from conditions following colds, la grippe and influenza; would increase personality and stamina, aid in developing the blood, improve the color and appetite and quiet the nerves; would increase weight, promote better sleep and assimilation of food and improve the nerves, stomach and bowels.—[D. D. N. J., F. D. C. 639; February 1943.]

Vigor-Tex.—Kretschmer Corporation, Saginaw, Mich. Shipped between May 12 and 17, 1941. Composition: about 42 per cent of wheat germ, the remainder being essentially wheat bran and small amounts of starch. Misbranded because labeling falsely represented that the product would build vitality, promote better health and provide the life principle needed for the functioning of all organs; would correct low spirits, discouragement and weariness, strengthen the heart muscle and normalize the blood pressure; would cause children to thrive, grow in height and weight and improve their appetites and general health; would prevent sleeplessness, poor heart action, fatigue, indigestion and gray hair; would be a preventive and appropriate treatment of constipation, arthritis, neuritis, colitis, colds, simple and pernicious anemia, diabetes, skin blemishes, brittle nails, stomach ulcers, heart trouble, hardening of arteries, high blood pressure, glandular deficiency, acidosis and underweight and overweight conditions.—[D. D. N. J., F. D. C. 640; February 1943.]

DANGEROUS TO HEALTH

Because of Inadequate Warnings on Labels

[EDITORIAL NOTE.—These abstracts differ from other abstracts of Notices of Judgment issued by the Food and Drug Administration of the Federal Security Agency which have appeared in these pages in that they deal with nostrums which were misbranded because their labels failed to carry adequate warnings against giving them to children or using them in the pathologic conditions in which they might be dangerous to health, or caution against unsafe dosages or methods of duration of administration or application, for the protection of the user. The abstracts that follow are given in the briefest possible form; (1) the name of the product; (2) the name of the manufacturer, shipper or consigner; (3) the date of shipment; (4) the composition; (5) the type of nostrum; (6) the reason for the charge of misbranding, and (7) the date of issuance of the Notice of Judgment.]

Barkolyn.—Standard Medicines Company, Columbus, Ohio. Shipped May 30, 1941. Composition: essentially extracts of plant drugs, including laxatives, and strychnine. Misbranded because label failed to give adequate directions for use, since product was a laxative and labeling suggestions provided for continuous use, which might lead to dependence on a laxative. Also misbranded because directions for use by children were indefinite. Further misbranded because labeling failed to give adequate warnings against use by children or in those pathologic conditions wherein it might be dangerous to health, or caution against unsafe dosage or duration of administration, since there was no warning that administration of a product containing strychnine might be especially dangerous to elderly persons. Again misbranded because of lack of warning that a laxative should not be taken by anyone suffering from nausea, vomiting, abdominal pains or other symptoms of appendicitis. Misbranded, finally, because label failed to declare quantity or proportion of strychnine present.—[D. D. N. J., F. D. C. 663; February 1943.]

Dickson's Laxative Diuretic.—James B. Nichols, trading as J. B. Nichols and Sons and Nichols Chemical Company, Memphis, Tenn. Shipped Nov. 12, 1940. Composition: essentially epsom salt, with small amounts of caramel, methenamine, hyoscyamine, and salicylic, sulfuric and benzoic acids, strychnine, saccharin and water. Misbranded because labeling did not adequately warn again use in those pathologic conditions wherein product might be dangerous to health or caution against unsafe dosage or methods or duration of administration for protection of users, or against use when abdominal pain, nausea, vomiting or other symptoms of appendicitis are present, or warn that frequent or continued use might result in dependence on laxatives. Further misbranded because statements on label falsely represented that each bottle contained 8 ounces of the substance, which it did not; that the mixture would aid in eliminating and correcting disorders of the alimentary canal, urinary organs, biliousness, headache, stomach gas and backache. Also misbranded in that it consisted of two or more ingredients and label did not declare common or usual name of each, as well as quantity or proportion of hyoscyamine and strychnine. Again misbranded because the designation "Utopian" did not properly identify the methenamine present. Misbranded, finally, because label failed to declare quantity of contents in terms of measure and bottle was so made and formed as to be misleading.—[D. D. N. J., F. D. C. 661; February 1943.]

Dickson's Laxative Rheumatic Diuretic.—A. H. Dickson, Memphis, Tenn. Shipped Nov. 7, 1941. Composition: essentially epsom salt, methenamine, sodium salicylate, sodium benzoate, salicylic acid, methyl salicylate and caramel coloring. Misbranded because labeling did not give adequate directions for use, particularly as to duration and limitation, since a laxative should not be taken often. Further misbranded because label failed to give adequate warning against administering to children or against use in those pathologic conditions wherein it might be dangerous to health, or caution against taking when abdominal pain, nausea, vomiting or other symptoms of appendicitis are present, or warn that frequent or continued use might result in dependence on laxatives. Also misbranded because label falsely represented that the product would be efficacious for rheumatic, urinary and constipated conditions.—[D. D. N. J., F. D. C. 704; April 1943.]

Grover Graham Remedy and Graham's Pills.—S. Grover Graham Company, Inc., Newburgh, N. Y. Shipped Jan. 20 and July 15, 1941. Composition: the first-named was essentially a mixture of magnesias, sodium bicarbonate, sodium bromide, extract of ginger and a small amount of chloroform with alcohol and water, flavored with peppermint oil and colored with a violet red dye. The pills contained aloe, podophyllin, gamboge and capsicum. The "Remedy" was misbranded because label did not bear adequate directions for use, since those given provided for an excessive amount of sodium bromide and no limitation was put on the amount of bromide to be administered daily. Further misbranded because label failed to warn adequately against use in those pathologic conditions wherein it might be dangerous to health, or caution against unsafe dosage or methods or duration of administration, since it did not caution the user that frequent or continued administration might lead to mental derangement, skin eruptions or other serious effects, and that it should not be taken by those suffering from kidney diseases. Also misbranded because label falsely represented that the product would be efficacious for indigestion, bloating, dyspepsia, gastritis, constipation and other forms

of stomach disorders and distress due to faulty digestion, and that it was harmless and non-habit forming. Graham's Pills were misbranded because represented as being an intestinal eliminant.—[D. D. N. J., F. D. C. 665; February 1943.]

Norwich Laxative Cold Tablets.—Norwich Pharmacal Company, Norwich, N. Y. Shipped Nov. 7, 1941. Composition: in each tablet 1 grain of acetanilid and unnamed amounts of podophyllin, aloin, and other drugs of plant origin, including quinine, camphor and cayenne pepper. Misbranded because label did not bear adequate warnings against unsafe duration of administration, for protection of users, since it failed to warn the consumer that frequent or continued use might be dangerous to health in causing serious blood disturbances, anemia, collapse, or dependence on the drug, and that it should be discontinued if skin rash appears. Further misbranded because of label representations that product would affect the underlying cause of the common cold, prevent its full development and shorten its duration, whereas its therapeutic efficacy is limited to that of an analgesic and laxative which might temporarily ameliorate some of the symptoms of the common cold but not those of feverishness, tickling throat sensations and running of the nose.—[D. D. N. J., F. D. C. 667; February 1943.]

Pinee.—Pinee Chemical Company, Kinston, N. C. Shipped Oct. 1, 1941. Composition: acetanilid (not more than 3.6 grains per fluid ounce), alcohol (not in excess of 10.9 per cent), small amounts of menthol, camphor, laxative plant drugs, ammonia, licorice, ammonium chloride, and a trace of alkaloids. Adulterated because its strength differed from that indicated on the package, namely, "Acetanilid 6 Grs to oz Maximum Alcohol 20 per cent." Misbranded because of inadequate label directions for use, since those given provided for continuous administration and hence were inadequate for a laxative, since the product, when taken in such manner, might create a dependence on laxatives. Further misbranded because label did not adequately warn against giving to children or use in those pathologic conditions wherein it might be dangerous to health, or caution against unsafe dosage or duration of administration. Misbranded, also, because name of product and designs of pine trees on label and carton gave the impression that the product contained something derived from pine, whereas it did not, nor did it offer any ingredient or combination of ingredients capable of preventing or curing either head or chest colds or alleviating their common symptoms. Misbranded, finally, because label statements (required by law) of active ingredients, and total quantity of contents and directions for use were not sufficiently conspicuous on the label to render them likely to be read or understood by the ordinary individual.—[D. D. N. J., F. D. C. 668; February 1943.]

Samaritan Treatment Preparations—Sterile Solution Formula No. 3, Rx Formula No. 8 and S.G.M. a. (Oral).—The Samaritan Treatment, Chicago. Shipped Dec. 31, 1940. Composition: Sterile Solution Formula No. 3: a solution of strychnine, emetin, ephedrine, pilocarpine and sparteine; Rx Formula No. 8: capsules each containing approximately 0.6 Gm. of a powder composed chiefly of iron and ammonium citrate; S.G.M.a. (Oral): capsules each containing animal materials including 0.16 grain of thyroid. These capsules were declared misbranded because the labeling failed to give adequate directions for use, in that it did not sufficiently warn against administering the product to children or using it in those pathologic conditions wherein it might be dangerous to health, or caution against unsafe dosage or methods or duration of administration. Also misbranded because package failed to give name and place of business of manufacturer, packer or distributor, or quantity of contents or common or usual name of the article, or amount of thyroid that it contained. The two other preparations were declared misbranded largely for the reasons given above.—[D. D. N. J., F. D. C. 671; February 1943.]

Special Formula Tablets.—Arner Company, Buffalo. Shipped Oct. 15, 1941. Composition: boric acid and an effervescent mixture of soda and citric acid. Misbranded because label failed to give adequate directions for use and sufficient caution against giving to children, which omission might constitute danger to health, and against unsafe dosage or duration of administration for protection of users, since label carried no warning that repeated daily administration would cause deleterious systemic effects and injurious gastrointestinal disturbances. Further misbranded because label did not give common or usual name of each active ingredient.—[D. D. N. J., F. D. C. 669; February 1943.]

Special S. C. White Pills Rx 2609.—Charles H. Dietz, Inc., St. Louis. Shipped Nov. 22, 1941. Composition: label declared each pill to contain aloes, $\frac{3}{4}$ grain; ferrous sulfate, $\frac{1}{4}$ grains, and oil of pennyroyal, $\frac{1}{4}$ minim. Misbranded because label did not give adequate directions for use and failed to caution sufficiently against use in those pathologic conditions wherein it might be dangerous to health, since label did not warn that product should not be taken when nausea, vomiting, abdominal pains or other symptoms of appendicitis are present, or caution against unsafe dosage or duration of administration, since frequent or continued use might result in dependence on a laxative.—[D. D. N. J., F. D. C. 670; February 1943.]

Vinco Herb Tablets.—Vinco Herb Company, Dayton, Ohio. Shipped Oct. 28, 1940. Composition: essentially aloe and extracts of plant drugs including capsicum and an emodin-bearing substance. Misbranded because not properly labeled to warn against use by young children or in conditions wherein it might be dangerous to health, since label did not caution user that frequent or continued administration might result in dependence on laxatives. Further misbranded because falsely represented on label to be an appropriate treatment for coated tongue, flatulence, sour stomach simple headache, acid indigestion, dull eyes, sallow skin and some other disorders, make life happy and enjoyable and provide a clean, healthy condition of the mind and body.—[D. D. N. J., F. D. C. 619; February 1943.]

Correspondence

"FLUORIDE AND DENTAL CARIES"

To the Editor:—I wish to call your attention and that of your readers to several rather serious flaws in the review "Fluoride and Dental Caries" published in *Current Comment* (THE JOURNAL, January 8, p. 98). This survey is unfortunate in that it fails to provide the reader with the most essential of the three lines of evidence proving a relation between fluorine and dental caries. Furthermore, it creates an erroneous impression with regard to the history of discoveries bearing on this problem, and, finally, it contains a serious error in factual statement regarding the production of mottled enamel by topical application of fluorine. While the epidemiologic studies referred to (Dean, H. T.: *Pub. Health Rep.* 53:1443 [Aug. 19] 1938) and later investigations by Dean and his co-workers have furnished substantial and convincing evidence for the protective action of fluorine against dental caries, these studies were not the first to indicate the role of fluorine in promoting caries resistance. This relationship might have been surmised in 1931 when higher than usual concentrations of fluorine in drinking water were discovered (Smith, M. C.; Lantz, E. M., and Smith, H. V.: *Arizona Agr. Exp. Sta. Tech. Bull.* 32, 1931. Churchill, H. V.: *Indust. & Eng. Chem.* 23:996, 1931) to be the factor responsible for the occurrence of mottled enamel. It had already been noted by F. S. McKay (*J. Am. Dent. A.* 15:1429, 1928) that mottled teeth, in spite of their abnormal structure, apparently develop fewer caries than teeth not exhibiting detectable mottling.

Actually, the first objective evidence for the protective role of fluorine in relation to caries was presented early in 1937 at meetings of the International Association for Dental Research (Armstrong, W. D., and Brekhuis, P. J.: *J. Dent. Res.* 16:309, 1937) and the American Society of Biological Chemists (Armstrong, W. D.: *J. Biol. Chem.* 119:v, 1937). These investigations, which were later described in greater detail (Armstrong, W. D., and Brekhuis, P. J.: *J. Dent. Res.* 17:393 [Oct.] 1938) demonstrated a significantly higher fluorine content of the enamel removed from sound teeth than was present in the undecayed enamel of carious teeth. Considerations were offered to indicate that the low fluorine content of the enamel of carious teeth was not secondary to the carious process.

Apart from the fact that the review is inaccurate from the historical standpoint, it is incomplete in that one of the major lines of evidence indicating the relationship of fluorine to resistance to dental caries is not presented to the reader. As the review states, the two other lines of investigation in this connection are (a) epidemiologic surveys, which have shown an inverse relationship between the prevalence rates of dental caries and the fluorine content of communal water supplies, and (b) the demonstration that extra fluoride supplied to rats under a variety of conditions decreases the incidence of experimental caries in this species. The third line of evidence referred to, derived from studies of chemical composition of sound and carious teeth, was omitted entirely although it was the first definitive evidence on the question and is still the most significant fact known about dental caries resistance. This is the fact that enamel from the sound portions of carious teeth have significantly and consistently low fluorine content, as compared with that of noncarious teeth from the same or other individuals. Without this knowledge it would still be impossible to formulate a rational view of the role played by fluorine in caries resistance and prevention.

The last sentence of the review states absolutely erroneously in connection with the discussion of the results of topical application of fluoride to the teeth as a means of reducing the incidence of dental caries, that it will be necessary to determine the minimum effective concentration since an excess of fluoride is bound to produce mottled enamel. Contrary to this assertion, the facts are clear in demonstrating that there is no possibility of producing mottled enamel by the topical application of a solution of fluoride of any concentration to the erupted teeth. Mottled enamel results only when fluoride above threshold amounts is absorbed during the period of enamel formation. The elimination of the possibility of producing some degree of mottled enamel is one of the advantages which the method of topical application of fluorides to teeth as a means of reducing the incidence of caries possesses over the alternative method, namely addition of fluorine to public water supplies.

MAURICE B. VISSCHER, M.D.,
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Minneapolis.

To the Editor:—The editorial comment on the effect of fluoride in inhibiting dental caries in THE JOURNAL, January 8, was excellent. It calls attention to the awakened interest in controlling this disease by other than strictly mechanical means and points up the fact that there are biologic methods other than dietary which may bring about a diminution in the incidence of caries.

It is interesting that, as a result of the laboratory and clinical studies mentioned in the comment and others, fluoride is now being considered the active principle which may accomplish the desired result. During the investigations on endemic dental fluorosis and the relationship of this condition to lowered incidence of caries there was a feeling that fluoride may have been merely an indicator, not the actual active principle.

Attention should be directed to the fact that fluoride is not the only substance which may have similar action on caries. Clinical studies have been conducted on a quinine-urea combination which seems to have a similar inhibitory action (Wach, E. C.; O'Donnell, J. F., and Hine, M. K.: Effects of a Mouth Rinse on Oral Acidogenic Bacteria, *J. Am. Dent. A.* 29:61 [Jan.] 1942). Laboratory data have been accumulated on the action of iodoacetate which is inhibitory to experimental production of caries in rats (Dale, P. P., and Powell, V. H.; Inhibition of Experimental Dental Caries in Rat by Iodoacetic Acid, *J. Dent. Res.* 22:33 [Feb.] 1943). Likewise some of the synthetic detergents act to inhibit the drop in pH of dental plaque material which otherwise occurs after ingestion of carbohydrates and especially sugars (Stephan, R. M.: Changes in H Ion Concentration on Tooth Surfaces and in Carious Lesions, *J. Am. Dent. A.* 27:718 [May] 1940. Stephan, R. M., and Miller, B. F.: A Quantitative Method for Evaluating Physical and Chemical Agents Which Modify Production on Acids in Bacterial Plaques on Human Teeth, *J. Dent. Res.* 22:45 [Feb.] 1943; Effect of Synthetic Detergents on pH Changes in Dental Plaques, *ibid.*, p. 53). These studies indicated that intensive research is being carried on to determine the worth of various materials which may interfere with the mechanism of cavity production in the teeth.

One final comment on the comment. The last sentence states that "an excess of fluoride is bound to produce chronic dental fluorosis." It has been definitely established that chronic fluorosis is produced only when dentally toxic (over 1 part per million) amounts of fluoride are imbibed in the drinking water during the period of formation of enamel, and the enamel of each individual tooth is completed on an average of two to three

years before its eruption. Once this enamel formation is complete the only alteration in its structure is decalcification. Therefore it would be impossible for topically applied fluoride to produce fluorosis.

HENRY M. WILBUR, D.D.S., Omaha.

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University of Nebraska College of Medicine.

MESENTERIC INJURY DUE TO NON- PENETRATING ABDOMINAL TRAUMA

To the Editor:—I wrote to Dr. D. Henry Poer, Atlanta, Ga., concerning the article by him and Dr. Edward Woliver on intestinal and mesenteric injury due to nonpenetrating abdominal trauma (*THE JOURNAL*, Jan. 3, 1942, p. 11). The letter was returned, however, since he is in the armed services.

In this article no mention was made of patients with mesenteric injury and no elaboration of his group A patients i. e. with delay more than twelve hours after the accident. If you have these data I would appreciate information on patients with injury to the mesentery and also how long over twelve hours some of the patients waited before seeing a doctor.

I just attended a man who had a heavy door fall on his abdomen and chest and seventy-two hours later intestinal obstruction developed as the result of 7 feet of intestine going through an opening in the terminal ileocecal mesentery.

HARRY S. FRANK, M.D., Middletown, Conn.

[The query was forwarded to Dr. Poer, who replied:]

To the Editor:—Emory University has recently forwarded your letter of 10 December 1943 to me in which you ask for additional information. I have reviewed all the notes I have available and find some information which may be of interest.

In our group A patients only 1 had mesenteric injury, and this was a man aged 30 who was crushed tangentially between two moving streetcars. He had severe injury to the abdominal wall with rupture of the rectus muscle, and at operation the mesentery was found to be torn but not seriously. This patient was operated on within two hours and recovered uneventfully.

With regard to the question of delay, 7 of our patients who were operated on and recovered came to the hospital twenty hours or more after injury. Three of these came in after forty-eight hours. The jejunum or ileum was injured in all of them except 1, who had a severe retroperitoneal hematoma without other complication. One was thrown from a horse and another from an automobile, and still another was struck in the abdomen during a basketball game. Another patient sustained his intestinal injury as the result of the forcible attempt to reduce a hernia. Another was kicked by a mule and still another was struck in the abdomen by a piece of lumber which was thrown from a saw.

DAVID H. POER, Lieutenant Colonel, M. C.,
Martinsburg, W. Va.

PREGNANCY TEST FROGS BEING BRED AT WILL

To the Editor:—In 1939, at the Annual Fortnight on Endocrinology at the New York Academy of Medicine, the African frog test for the diagnosis of pregnancy was first introduced in the United States. Since then the only drawback to the universal use of this frog, *Xenopus laevis*, in pregnancy diagnosis has been the difficulty in obtaining sufficient animals for all who have been interested in the test. The outbreak of worldwide hostilities made importation of animals from South Africa a hazardous undertaking, and our own supplies of *Xenopus* have been arriving at irregular intervals.

Attempts at breeding these animals in America prior to 1943 met with only sporadic success, and from the meager results obtained few, if any, of these frogs became available for general use.

Heartening news has come to us from Switzerland, where Gasche (1943), despite the restrictions of war-torn Europe, has succeeded in breeding *Xenopus laevis* and bringing them to maturity at will. His paper (*Die Zucht von Xenopus laevis* Daudin und ihre Bedeutung für die biologische Forschung, *Rev. Suisse de Zool.*, Geneva 50:262, 1943) has recently arrived in this country, and from his description and results it would appear that literally tens of thousands of these valuable animals can be made available in a six months period.

In essence, Gasche simply used the technic suggested by Shapiro in 1939 and injected both male and female *Xenopus laevis* frogs with urinary gonadotropic hormones. Mating and spawning followed within eight hours of injection.

We have now made arrangements to breed these animals in New York and it is our firm belief that, once obtainable in considerable numbers, *Xenopus laevis* will entirely replace rabbit, rat and mouse as indicators of pregnancy.

This note should be encouraging to other workers in this field, and both institutions with which we are affiliated plan to aid in making the results of our research available to all who are interested.

CHRISTOPHER W. COATES

ABNER I. WEISMAN, M.D.

New York.

The New York Zoological Society and the
Departments of Gynecology and Pathology
of the Jewish Memorial Hospital.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

BOARDS OF MEDICAL EXAMINERS BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in *THE JOURNAL*, Feb. 5, p. 386.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY: *Oral. Part II.* Chicago, June 12-16. Final date for filing application is March 12. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Written.* Various large cities, May 8. *Oral.* Chicago, June 9-10. Final date for filing application is April 1. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF INTERNAL MEDICINE: *Written.* Various centers, Oct. 16. Candidates in military service may take examination at their place of duty. Final date for filing application is August 15. Asst. Sec., Dr. W. A. Werrell, 1301 University Ave., Madison, Wis.

AMERICAN BOARD OF OBSTETRICS & GYNECOLOGY. *Written. Part I.* Various centers, Feb. 12. Candidates in military service may take Part I at their place of duty. *Oral. Part II.* Pittsburgh, June 7-13. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF OPHTHALMOLOGY: Chicago, Oct. 5-7. Sec., Dr. S. Judd Beach, P. O. Box 1940, Portland, Me.

AMERICAN BOARD OF OTOLARYNGOLOGY: *Oral.* New York City, June 1-4. Sec., Dr. Dean M. Lierle, University Hospitals, Iowa City, Ia.

AMERICAN BOARD OF PEDIATRICS: *Oral.* New York, March 25-26, and San Francisco, May 6-7. Sec., Dr. C. A. Aldrich, 115½ First Ave. S.W., Rochester, Minn.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: *Written.* Various centers, March 31. *Oral.* Philadelphia, May 12-13. Final date for filing application is Feb. 29. Sec., Dr. Walter Freeman, 1028 Connecticut Ave. N.W., Washington, D. C.

AMERICAN BOARD OF UROLOGY: *Oral.* Chicago, Feb. 15-17. Sec., Dr. Gilbert J. Thomas, 1409 Willow St., Minneapolis.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Malpractice: Alleged Negligence in Diagnosis and Removal of Cyst from Neck.—The plaintiff and her husband consulted the physician defendant relative to a cyst on the plaintiff's neck just under the ear. The physician felt of the cyst and informed them that it was small and could be removed without difficulty in about ten minutes at his office but that he preferred to perform the procedure at a hospital and that within thirty minutes after the patient entered the hospital she would be out. The patient then went to a hospital and after administering a local anesthetic the physician proceeded to remove the cyst. Apparently after the defendant had made a small incision and before he had commenced to operate he discovered that the cyst was embedded much more deeply than he had thought and, to use his expression, "I found out I had gotten into a mess," but while he informed his patient that the cyst was "a little deeper than he thought" he did not inform her of the exact situation nor did he ask her opinion as to whether he should proceed with the operation. According to the patient, while the operation was in progress, the physician said: "Uh, uh, I have done the wrong thing" and at that time she felt "like something terrible had happened, that everything had just fallen out, her whole nerves." The physician described the procedure as follows:

During the operation we found that this cyst instead of being a small cyst about the size of the end of your thumb had actually extended down between some muscles, which is very unusual. We were trying to make a small incision without making any more scar than necessary, and we cut down on the thing with knife through the skin. We got along fairly well. It took more time than I thought it would. I thought when I amined it that I could take it out in ten minutes and that is what told her in the office. I had taken out hundreds of them, and I never had had one that went down like this one did; and when I saw how it was, I could have stuck a hole in it and let the water out and stopped then, but it would have come right back, wouldn't have been any trouble at all. I could have backed right out and wouldn't have had anything, but men doing surgery have to do the best they can when they get into a mess. This was a mess. It was deep-seated, a thin wall cyst, and I was doing my best to get it out with as little trouble as I could.

Just what happened during the operation is not clear but apparently the facial nerve was stretched and the end result was unfortunate. The patient's mouth became drawn to one side, her tongue became partially paralyzed, she was unable to chew on one side and had no sense of touch on that side of her face. At times she could "hardly swallow," and tear ducts in the eye on that side would fill up and the "eye weeps and won't close." Subsequently the patient sued the physician for malpractice, alleging negligence in the diagnosis made by him at his office and in his performance of the operation at the hospital. From a judgment in favor of the plaintiff, the physician appealed to the circuit court of appeals, fifth circuit.

At the trial the plaintiff offered no expert medical testimony, relying on the testimony of herself and her husband as to the circumstances attending the making of the diagnosis and the performance of the operation, including what the physician discovered after the operation was commenced, and what he said during and after it. The physician testified, in effect, and two other physicians corroborated him, that in making the diagnosis in question and in performing the operation he possessed and exercised a reasonable degree of care and skill. He contended that in the absence of expert testimony as to his alleged negligence there could be no judgment against him. The patient, on the other hand, insisted that the disastrous results of the operation in contrast with the physician's original diagnosis, on which her consent to the operation was based, and the testimony referred to, raised an issue of fact as to whether or not looking at the diagnosis and operation as a whole the physician had in respect to them exercised a reasonable degree of care and skill and otherwise conducted himself as is required by law of a

physician. It is settled law in Georgia, said the circuit court of appeals, the state in which the diagnosis and operation was made and performed, that a physician does not guarantee the results of a treatment or operation and that proof alone that an operation is different in its outcome from that expected, or is followed by disastrous instead of beneficial results, neither establishes nor supports an inference of want of proper care, skill or diligence. In view, therefore, in the absence of expert opinion evidence that the physician did not, and the presence of such evidence that he did possess and exercise reasonable care and skill, both in making the correct diagnosis before he actually physically performed, and in physically performing the operation, we should, in the absence of other issues, feel compelled to order judgment for the physician. None of the statements alleged to have been made by the physician to his patient were sufficient to supply the critical absence of expert opinion evidence.

However, the court concluded that even though the issue had not been raised in the pleadings, it had the right to consider the question as to whether or not the physician did not breach the obligation that he owed his patient when, after making the incision and ascertaining that the operation would not be the absolutely simple one he had secured the patient's consent to perform, but a serious and difficult one fraught with possible, if not probable dangers, he went ahead without making full disclosure of the difficulties attending, and the possible dangers of, the operation and securing her consent to go forward under the new found conditions. The law, continued the court, is well settled that an operation cannot be performed without the patient's consent and that one performed without consent, express or implied, is a technical battery or trespass for which the physician is liable. The obligation underlying this rule is not satisfied by a consent obtained under a mistaken diagnosis that the operation is simple and without danger, when a later diagnosis, while the patient is still conscious and no emergency exists, discloses that the operation is both difficult and dangerous. The rule extends no further than to hold that if a physician advises his patient to submit to a particular operation and the patient weighs the dangers and results incident to its performance and finally consents, he thereby in effect enters into a contract authorizing the physician to operate to the extent of the consent given but no further. The same principle which supports the holding that a physician performing an operation without the patient's consent, express or implied, commits a battery or trespass for which he is liable in damages, also supports the holding that a physician may not perform an operation different in kind from that consented to or one involving risks and results not contemplated.

In view of the circumstances, the court could not say that a verdict for the physician was demanded or that the judgment in favor of the patient should be affirmed. The correct issue, the court thought, was whether or not the physician in proceeding with the operation as he did after discovering its true character committed a trespass on his patient or a breach of his obligation to exercise the care and skill required of him. This issue was not developed and tried as it should have been in the trial court. The court accordingly reversed the judgment in favor of the patient and remanded the cause for a new trial.—*Wall v. Brim*, 138 F. (2d) 478 (1943).

Society Proceedings

COMING MEETINGS

- Annual Congress on Industrial Health, Chicago, February 15-16. Dr. Carl M. Peterson, 535 N. Dearborn St., Chicago 10, Secretary.
- Annual Congress on Medical Education and Licensure, Chicago, February 14-15. Dr. Victor Johnson, 535 N. Dearborn St., Chicago 10, Secretary.
- National Conference on Medical Service, Chicago, February 13. Dr. C. L. Palmer, 500 Penn Avenue, Pittsburgh 22, Secretary.
- New Orleans Postgraduate Medical Assembly, New Orleans, March 6-9. Dr. Joseph S. D'Antoni, 1430 Tulane Ave., New Orleans 13, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1934 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Am. J. Syphilis, Gonorrhea and Ven. Dis., St. Louis

27:657-810 (Nov.) 1943

- *Differential Diagnosis of Lymphogranuloma Venereum and Chancroid by Laboratory and Skin Tests. L. W. Knott, L. H. T. Bernstein, H. Eagle, T. E. Billings, R. L. Zobel and E. G. Clark.—p. 657.
- Extent of Syphilis Problem at Beginning of World War II. R. A. Vonderlehr and Lida J. Usilton.—p. 686.
- Observations on Specificity of Frei Test in Army Personnel Using Lygranum Antigen. A. Gelperin.—p. 697.
- Treatment of Chancroid with Sulfathiazole. F. C. Combes, O. Canizares and S. Landy.—p. 700.
- Method of Transmitting Gonococcus Culture Specimens Through the Mail. D. Bergsma and R. Stein.—p. 703.
- Clinical Diagnosis of Uncomplicated Syphilitic Aortitis. P. E. Mattman and J. E. Moore.—p. 711.
- Experimental Prophylaxis of Gonococcal Infections. F. B. Bang.—p. 716.

Differential Diagnosis of Lymphogranuloma Venereum and Chancroid.—Knott and his collaborators studied the Ito-Reenstierna test, the Frei test, the lygranum skin test, the lygranum complement fixation test and changes in the serum protein and in serum albumin-globulin ratio in the differentiation of chancroid and lymphogranuloma venereum. The groups studied were 44 patients with chancroid, 31 with lymphogranuloma inguinale, 18 with lesions other than lymphogranuloma venereum, chancroid or syphilis, 11 contacts of patients with the aforementioned lesions, 78 with early syphilis and 20 normal controls. An initial diagnosis was made on the basis of the history and physical examination without regard to the subsequently observed results of the skin or laboratory tests. In the differential diagnosis of buboes due to lymphogranuloma venereum and chancroid the criteria suggested by Brandt and Torpin were found helpful. The Ducrey vaccine was used for the skin tests. All patients were tested with a pus antigen of lymphogranuloma venereum. After the study was begun a suspension of the lymphogranuloma virus grown in egg yolk sac (lygranum) and the control antigen derived from uninfected eggs became available, and all subsequent patients were tested with both the pus and cultured antigens. The skin test was repeated on many patients after six weeks and again at the end of three months. The results of the diagnostic skin tests (Ito-Reenstierna, Frei and lygranum) for chancroid and lymphogranuloma venereum should be interpreted with caution. A positive reaction does not necessarily establish the diagnosis, and a negative reaction does not exclude it. The specificity of the lygranum complement fixation test is challenged by the large number of positive reactions found in the serums of patients giving no history and presenting no clinical signs of the disease and also by the possible cross reactivity with other venereal diseases, particularly syphilis. In a case of syphilis the initial results of the lygranum complement fixation procedure are unreliable and the test should be repeated throughout the course of the antisyphilitic therapy. Biologic false positive tests for syphilis occur with surprising frequency in cases of chancroid, lymphogranuloma venereum and other types of nonsyphilitic genital lesions; therefore arsenic therapy should not be initiated on a patient with a dark field negative genital lesion and a low titrated serologic test. The determination of the total serum protein and albumin-globulin ratio is of little value in the differential diagnosis of genital lesions. The best criterion in the differential diagnosis of chancroid and lymphogranuloma venereum remains the clinical appearance of the lesion. The skin reactions and serum tests are at best of confirmatory value.

Archives of Dermatology and Syphilology, Chicago

48:579-708 (Dec.) 1943

- *Actual Causes of Certain Occupational Dermatoses: Study of 527 Cases, with Special Reference to Dermatoses Due to Mineral Oils. J. V. Klauder.—p. 579.
- Effect of Androgen on Sebaceous Glands of Human Skin. H. R. Rony and S. J. Zakon.—p. 601.
- Vitiligo of Upper Lip in Players of Wind Instruments. C. W. Freeman and H. H. Hazen.—p. 605.
- Necrobiosis Lipoidica Diabeticorum with Xanthoma Cells: Case. L. Nicholas.—p. 606.
- Dermatitis Due to Nail Polish: Report of 2 Cases with Experimental Studies. H. Keil, J. J. Russo and L. S. Van Dyck.—p. 612.
- Production of Bullae in Skin of Duck: II. Experiments with Bullae Produced by Vesicants. L. Goldman, N. Nelson and I. A. Mirsky.—p. 616.
- Complement Fixation Test for Lymphogranuloma Venereum: Results Obtained with Its Use. A. W. Grace and G. Rake.—p. 619.
- Syphilitic Juxta-Articular Nodules. F. Kalz and B. L. Newton.—p. 626.
- Virus Diseases of Skin, with Special Reference to Elementary and Inclusion Bodies: I. Variola-Vaccinia and Molluscum Contagiosum. M. H. Ebert and M. Otsuka.—p. 635.
- Acanthosis Nigricans: Is It a Form of Avitaminosis? L. Hollander.—p. 650.

Causes of Occupational Dermatoses.—Klauder made a study of 1,113 cases of cutaneous diseases in patients who presented claims for compensation. The condition in 527 was diagnosed as occupational in origin and in 586 as nonoccupational. Of the 527 occupational dermatoses 131 were caused by trauma and accidental injury, 128 by primary irritants (acids, alkalis, solvents), 86 by cleansing agents applied to the skin, 66 by sensitizing substances, 45 by petroleum products and 48 by wet work. There were 21 cases of occupational folliculitis caused by chlorinated hydrocarbons, vegetable oil and dust. Trauma and accidental injury caused pyoderma, dermatitis, ulcer of the leg, traumatic herpes zoster, alopecia areata, psoriasis, anthrax, erysipeloid and sporotrichosis. Primary irritants include solvents, alkalis, chromic acid and chromates, pigments and dyes, paints and varnishes and acids. Volatile solvents were the cleansing agents which most frequently caused dermatitis. They included gasoline, type wash, turpentine, paint thinner, kerosene, naphtha, alcohol and toluene. Substances causing sensitization dermatitis included petroleum products, anticorrosion oils, linseed oil, a powder used as a germicidal detergent for glasses, solution through which nylon thread ran on knitting machines, a varnish made from the oil extracted from cashew nuts, ingredients used to cover colored paper and cardboard, phenol-formaldehyde resin products, chrysanthemums, ragweed, feverfew, vanilla, cinnamon, insecticides, glues, trinitrotoluene, and permanent wave and scalp lotions. Mineral oils causing dermatoses were metal working oils, rust preventive compounds and the like. Oil folliculitis is the most frequent dermatosis in workers exposed to lubricating oils. Workers handling wire covered with halowax, a chlorinated naphthalene, frequently develop a folliculitis. Employees of sugar refineries develop sugar folliculitis. Dermatitis caused by wet work was seen in nurses, barbers, beauty parlor operators, janitors, scrub women, kitchen workers and soda fountain clerks. Workers should not be compelled to keep their hands wet with solution for hours at a time. All workers engaged in wet work should use an emollient at the end of the work day.

Bull. of the U. S. Army Med. Dept., Washington, D. C.

70:1-90 (Nov.) 1943

- *Scrub Typhus. A. J. Corbett.—p. 34.
- Early Medical Service in New Guinea. L. S. Eagleburger.—p. 55.
- *Pseudo Bronchiectasis Following Atypical Pneumonia. B. Blades and D. J. Dugan.—p. 60.
- Dental Ward in Station Hospital. F. A. Tyler.—p. 69.
- Spray Process for Making Whole Egg Powder. J. Payton.—p. 71.

Scrub Typhus.—Corbett points out that in the Pacific area there is a typhus-like disease known as tsutsugamushi fever. It is known under a number of names, such as tropical typhus, mite bite fever, scrub typhus, rural typhus and Japanese river fever. These diseases have a common etiologic agent, namely Rickettsia orientalis. They are similar clinically, serologically and pathologically with one exception, in that the mite bite fever of Sumatra does not present a primary skin ulcer. The disease differs from murine typhus, epidemic typhus and Rocky Mountain spotted fever principally by being mite borne and by its serologic reaction. Scrub typhus causes agglutination with

Bacillus proteus vulgaris OX, Kingsbury strain, and does not cause agglutination with *B. proteus vulgaris* OX 19. Scrub typhus is usually characterized by an abrupt onset, high fever, severe headache, photopsia and occasionally dizziness, nausea and vomiting. The febrile course is of the high remitting type varying from 101 to 103 F. A primary eschar is usually present. On the sixth to the eighth day a maculopapular rash appears on the trunk, arms and legs. Frequently there is a definite diminution in hearing. In severe cases cerebral symptoms may be pronounced. Generalized lymphadenopathy is a characteristic finding, the enlarged nodes being somewhat tender. Those draining the area of the primary eschar are involved to a greater extent. The patients usually present a rapid and sometimes irregular pulse and an increase in respiratory rate. As a rule the disease terminates at the end of the second week in rapid lysis, when the subjective and objective symptoms regress rapidly. The convalescence is lengthy and uneventful save for protracted physical exhaustion. Death is usually the result of cardiac failure, frequently with complicating bronchopneumonia.

Pseudo Bronchiectasis Following Atypical Pneumonia.—Blades and Dugan point out the difficulties in differentiating between atypical pneumonia and pulmonary tuberculosis and certain potentially surgical diseases of the chest. A sharply localized zone of atelectasis in a roentgenogram may suggest a pulmonary tumor, and basilar densities in the roentgenogram of a patient with chronic productive cough might lead to a diagnosis of bronchiectasis. Delineation of the bronchi with radiopaque oil will, under ordinary circumstances, settle the diagnostic problem. The authors demonstrated that, following atypical pneumonia, iodized oil bronchograms may occasionally give the erroneous impression of a true bronchiectasis. The temporary nature of the bronchial dilatations was proved by visualization of the bronchi a few weeks later, showing a complete return to normal bronchial configuration. If one is aware that atypical pneumonia is capable of producing temporary dilatation of the bronchi, an early or dry bronchiectasis could for time be considered a pseudo bronchiectasis. Progression of symptoms and repeated demonstration of the bronchial dilatation would soon establish the correct diagnosis. Failure to consider the possibility of a pseudo bronchiectasis might result in unnecessary resection of lung tissue.

Connecticut State Medical Journal, Hartford

7:811-878 (Dec.) 1943

- How the Flying Fighters' Doctor Is Made. E. G. Reinartz.—p. 820.
Anxiety and Fatigue. F. J. Braceland and H. P. Rome.—p. 827.
Subacute Meningococcal Septicemia: Report of Case. W. F. Smith.—p. 832.
Congenital Deformity with Hypertrophy of Both Feet. E. H. Crosby.—p. 833.
Acute Osteomyelitis of Cervical Spine with Spinal Cord Pressure: Report of 1 Case with Surgical Cure. W. B. Scoville and R. A. Raskind.—p. 835.

Diseases of Chest, Chicago

9:467-552 (Nov.-Dec.) 1943

- *Observations on Tuberculosis in City of Cordoba and Pampa De Achala, Argentina, and Minneapolis, Minnesota. F. Torres, A. Caeiro, J. A. Myers and F. E. Harrington.—p. 467.
Cavernous Hemangioma of Lung: Secondary Polycythemia. A. Goldman.—p. 479.
*Air Embolism in Artificial Pneumothorax: Report of 3 Cases. S. Jacobs.—p. 487.
Intrapleural Pneumolysis. J. E. Dailey.—p. 492.
Interpleural Communication in Bronchiectasis. F. I. Terrill and K. A. Tyler.—p. 496.
Contagiousness of Tuberculosis: Its Relationship to Compensation Claims. E. Mayer and I. Rappaport.—p. 500.
Lobectomy for Pulmonary Suppuration, Revealing Foreign Body Retained for Twenty-Six Years: Case Report. L. F. Knoepf.—p. 510.
Change in Rate of Circulation and Venous Pressure Following Collapse Therapy in Pulmonary Tuberculosis. O. Feinsilver.—p. 514.

Tuberculosis in Argentina and Minnesota.—Torres and his collaborators made tuberculin tests on six groups of children in the province of Cordoba, Argentina, and on a group of Minneapolis children, 1,288 Argentine children and 2,881 Minneapolis children being tested. Among the Cordoba children the percentage of reactors to tuberculin ranged from 12.7 to 58.6, the average being 51.1. The low percentage of 12.7 was obtained among 71 children ranging from 6 to 15 years of age, who

resided in Pampa De Achala, where there is little contact with large centers of population. In the Minneapolis group of 2,881 children 23.1 per cent reacted definitely and 0.6 per cent questionably to tuberculin. Among the 1,288 Cordoba children 741 had x-ray inspection of the chest. The films presented evidence of disease, which was the first infection type of tuberculosis in the pneumonic stage in 6.9 per cent and the reinfection type of pulmonary tuberculosis in 1.7 per cent. In 17.6 per cent, small sharply outlined dense shadows were seen in the pulmonary parenchyma, the hilar region or both. Among the 648 tuberculin reactors in the Minneapolis group the first infection type of tuberculosis in the pneumonic stage was found in 2.3 per cent. On the first examination the reinfection type of pulmonary tuberculosis was found in 0.2 per cent; however, on subsequent examinations this type of disease appeared in 1.1 per cent. Sharply outlined small densities were seen in 21.1 per cent. Apparently the disease has the same characteristics among the children of the two nations. The Pampa De Achala observations are unique. Here is an isolated community of families devoting their lives for the most part to the raising of sheep at an altitude of about 8,000 feet. Of 183 persons tested with tuberculin, the incidence of reactors was only 12.2 per cent among those of 16 to 25 years of age. However, in the older age group the incidence was 65.2 per cent, while the average for all ages was 32.2 per cent. Of the 116 persons in this group who had x-ray film inspection of their chests there was evidence of the first infection type of tuberculosis in the pneumonic stage in 0.8 per cent, but in no one was there any evidence whatever of the reinfection type of tuberculosis. Small dense sharply outlined shadows were present in 22.4 per cent.

Air Embolism in Artificial Pneumothorax.—Jacobs reports 3 nonfatal cases of air embolism in pneumothorax. The mild psychic manifestations, moderately severe sensorimotor symptoms and extremely severe motor type symptoms and signs were similar to those of cerebral lesions. Since these syndromes are due to entrance of air into a pulmonary vein, usually because the pulmonary parenchyma is ruptured by the pneumothorax needle, the use of a meticulous technic is the best safeguard against this complication. The number of fatalities produced is definitely too small to justify curtailment of a collapse therapy program or to justify withholding the benefits of artificial pneumothorax from patients whose pulmonary tuberculosis may conceivably be controlled by it. The 3 reported cases occurred within a period of nine days and constituted the only such pneumothorax accidents in about 2,500 "refills."

Florida Medical Association Journal, Jacksonville

30:221-268 (Dec.) 1943

- Foxglove. T. F. Hahn.—p. 235.
Cavernous Sinus Thrombosis with Recovery: Report of Case. H. Fuller.—p. 238.
Acute Left Ventricular Heart Failure: Report of Case in Which One Hundred and Forty-Six Attacks Occurred. J. Seltzer.—p. 240.
Preparation of Scientific Papers. S. Richardson.—p. 241.

Georgia Medical Association Journal, Atlanta

32:353-380 (Nov.) 1943

- Surgery of Thyroid. H. M. McKemie.—p. 355.
Some Problems That Should Be Considered by You. J. R. Lewis.—p. 359.
Problem of the Gallbladder: Factors in Surgical Results. R. L. Sanders.—p. 362.
Industrial Hygiene. L. M. Petrie.—p. 368.

Indiana State Medical Assn. Journal, Indianapolis

36:633-736 (Dec.) 1943

- War Problems Faced by Medical Profession. H. L. Kretschmer.—p. 633.
Army Medical Laboratory. J. L. Arbogast.—p. 637.
Physicians in the Services and in Civilian Life: Present Status. F. H. Lahey.—p. 638.
The Medical Profession Goes to War. J. Downes.—p. 640.
American Doctor in War. G. F. Lull.—p. 642.
Major Problems of Medical Department of Navy During Present Emergency. D. G. Sutton.—p. 644.
Army Air Forces' Convalescent Rehabilitation Training Program (First Year's Experience). H. A. Rusk.—p. 649.
Battle Casualties, with Special Reference to Use of Sulfonamides. J. F. Luten.—p. 652.
Why Medical Department Gets Job Done. G. A. Owsley.—p. 655.
Anesthesiologist in Army. F. W. Ratcliff.—p. 656.
Rescued Aviation Personnel in South Pacific. R. L. Hane.—p. 657.

Journal Neuropath. and Exper. Neurology, Baltimore
2:315-424 (Oct.) 1943

- *Histopathology of Progressive Muscular Dystrophy. G. H. Hassin.—p. 315.
- Diffuse Polymorphous Interarachnoidal Meningothelioma. O. Marburg, J. L. Anderson and P. Rezek.—p. 326.
- *Histopathologic Changes of Brain Caused by Intracranial Tumors (So-Called Edema or Swelling of Brain). G. E. Perret and J. W. Kernohan.—p. 341.
- Solitary Cerebral Gumma. J. G. Sheps.—p. 353.
- *Cerebral Aneurysms and Nontraumatic Massive Cerebral Hemorrhage. J. H. Globus and R. S. Globus.—p. 365.
- Histopathology of Central Nervous Tissue in Experimental Vitamin K Deficiency (Vitamin K Deficiency Hemorrhagic Diathesis). A. Ferraro and L. Roizin.—p. 392.
- Combined Myelin and Fat Stain: Technical Note. B. Kahn.—p. 411.

Histopathology of Progressive Muscular Dystrophy.

Hassin reports observations in several cases of muscular dystrophy. In 1 case the material was obtained post mortem, while in 3 biopsy was performed. In progressive muscular dystrophy definite changes occur in the muscles which may be termed idiopathic, that is independent of the condition of the spinal cord or the peripheral nerves. The alterations are in the form of atrophies, hypertrophies, loss of striations, myofibrillary disruption, obliteration of Cohnheim's fields, hyalinization and fatty metamorphosis (lipomatosis), all resulting in formation of a connective tissue scar (fibrosis). Fibrosis is represented by numerous microscopic connective tissue scars diffusely scattered in the muscles and resembling a similar process in multiple sclerosis where the scars are glial. The scar formation is in some instances preceded by phenomena of myophagia, in analogy to those of satellitosis and neuronophagia, which are so characteristic of degenerative conditions of the central nervous system (multiple sclerosis). The scars render the muscle changes irreversible, which is also in analogy to what is seen in multiple sclerosis and other degenerative conditions of the central nervous system. For investigation of pathologic changes, muscles obtained at necropsy have certain advantages and should be used whenever possible in preference to material obtained for biopsy.

Changes of Brain Caused by Intracranial Tumors.

Perret and Kernohan point out that each intracranial space occupying lesion brings about changes in the surrounding portion of the brain, and these changes in turn produce various neurologic symptoms. The most important change is an increase in the volume of the brain which gives rise to increased intracranial pressure. Such pressure is partly the result of the tumor itself and partly the result of surrounding edema. The reactions of the brain tissue to space occupying lesions, and especially tumors, are numerous and variable, affecting the various cellular elements in the brain. The authors present studies on 37 brains containing various types of neoplasms, and on 2 cases of abscess, 1 case of subdural hematoma and 1 case of generalized edema of unknown origin. The brains were removed after they had been injected with 10 per cent solution of formaldehyde through the carotid arteries from fifteen to sixty minutes after death. They were obtained from the cadavers of some patients who had undergone craniotomy and from the cadavers of others who had died without undergoing an operation. The authors also studied fresh tissue in the form of 93 specimens removed for biopsy in the course of an operation. Edema of the brain is nonspecific and is associated with all types of tumors of the cerebral hemispheres, the cerebellum and the brain stem; it is more generalized in the presence of intracerebral tumors, and especially the more malignant and rapidly growing gliomas. Increased intracranial pressure is the direct result of the edema which may remain local around the tumor or may be confined to one cerebral hemisphere or occasionally may be generalized in the whole brain. The edema is not specific for brain tumors. Edema is more prominent in the white matter than in the cortex and is characterized by a loosening of the ground substance, enlarged perivascular and pericellular spaces, swelling and proliferation of the astrocytes and oligodendroglia, and various types of degeneration of the nerve cells. The degenerated nerve cells become surrounded by numerous proliferated, swollen oligodendrocytes, which later frequently occupy the place left by the disintegration of the nerve cells. The edema is thought to

be caused by direct damage to the brain by the tumor, which with the production of circulatory disturbances leads to anoxia and acidosis of the brain tissue and the absorption of toxic products from necrotic tumor tissue.

Cerebral Aneurysm and Massive Nontraumatic Cerebral Hemorrhage.—Ten cases of ruptured cerebral aneurysm with consequent intracerebral and fatal intraventricular hemorrhage are reviewed. The cases demonstrate that softening of brain tissue results from an aneurysm of a neighboring cerebral blood vessel and concomitant alterations in its branches. This condition initiates changes in the brain tissue paralleling the progressive disease alterations in the aneurysmal wall which culminates in rupture of the aneurysm. The escaping blood finds its way into the neighboring previously softened brain tissue. Thence the blood, still under the influence of arterial pressure, breaks through a residual zone of partially softened tissue separating the so-called hemorrhagic cavity from the adjoining compartment of ventricular cavities and floods the latter as the fatal termination. This is a discouraging feature of cerebral aneurysm, one which received little recognition and which is responsible for many a surprising fatal termination. A fatal issue occurred as the result of intracerebral and intraventricular hemorrhage in 10 out of 20 cases of verified cerebral aneurysm. Surgical intervention in cerebral aneurysm is a hazardous undertaking. Encephalomalacia in the proximity of an aneurysm is most commonly encountered in relation to vessels constituting the rostral part of the circle of Willis. This explains the absence of symptoms, at least in the early phase, such as would point to the existence of brain softening preceding the intracerebral and intraventricular hemorrhage. Hypertension and cerebral arteriosclerosis are exceptional findings in cerebral aneurysm which has existed long enough to cause softening of brain tissue, rupture and flood with blood the softened brain tissue adjoining the affected vessel. It suggests that in the majority of instances the aneurysm is congenital in origin and not acquired as the result of arteriosclerosis or hypertension. Results of an experiment indicate that the tensile strength of brain tissue is a determining factor in intracerebral hemorrhages. The tensile strength of the brain tissue is appreciably higher than the intracranial pressure. Syphilis seems to play an insignificant role in the development of aneurysms. Previous attacks of subarachnoid hemorrhage may be regarded as clues to implication of brain tissue by aneurysm. Focal signs, in spite of disintegration of brain tissue, are rare. One fairly constant finding is the inequality of pupils, with the larger pupil on the side of the hemorrhagic lesion.

Journal of Pediatrics, St. Louis

23:497-630 (Nov.) 1943

- Electroencephalographic Response to Overventilation and Its Relation to Age. F. A. Gibbs, Erna L. Gibbs and W. G. Lennox.—p. 497.
- Nutrition Studies During Pregnancy: IV. Relation of Protein Content of Mother's Diet During Pregnancy to Birth Length, Birth Weight and Condition of Infant at Birth. Bertha S. Burke, Vernette Vickers Harding and H. C. Stuart.—p. 506.
- *Observations on Tetanus Immunization: The Dosage of Alum Precipitated Toxoid and Use of Fluid Toxoid After Trauma. J. J. Miller Jr. and J. B. Humber.—p. 516.
- Liver Function in Newborn Infant. G. W. Salmon and Ellen Ehrenfest Richman.—p. 522.
- *Roentgen Therapy of Interstitial Pneumonia. A. Oppenheimer.—p. 534.
- Breath Holding Spells: Their Relationship to Syncope, Convulsions and Other Phenomena. E. M. Bridge, S. Livingston and C. Tietze.—p. 539.
- Concurrent Meningococcal Meningitis and Salmonella Bacteremia. E. R. Neter.—p. 562.
- Jejunal Intussusception: Report of Case in Six Day Old Infant. E. P. Scott.—p. 565.
- An "Improved" Consultant's Case for Pediatric Physicians. R. A. Wilson.—p. 568.

Tetanus Immunization.—Miller and Humber compared the tetanus antitoxin titers attained in two groups of children. In the first group 68 children received two injections of 1 cc. each of combined alum precipitated diphtheria and tetanus toxoid at a minimum interval of eight weeks, followed by a third injection of 0.5 cc. of alum precipitated tetanus toxoid at a minimum of sixteen weeks later. In the second group 93 children received the first two injections but not the third. Between three and six months after completion of the injections, 13 of 26 children

in the "three injection" group had levels of 1.0 unit or more, whereas only 3 of 28 children tested in the "two injection" group exhibited similar levels. Furthermore, the levels of 3 children in the latter group had dropped below 0.1 unit. Between nine and fifteen months after completion of the injections the principal difference in the two groups was the proportion above and below the 0.1 unit level. This difference greatly favored the group which had three injections. There was also an opportunity to compare the speed of antitoxin production following alum precipitated and fluid toxoid reinjection. The authors conclude that three injections of alum precipitated tetanus toxoid at three monthly intervals initiate and maintain for one year antitoxin titers between 0.1 and 1.0 unit. This level is probably protective even if reinjection is impossible or is omitted at the time of trauma. A basic course of three injections and annual reinjection with alum precipitated toxoid are recommended for children. When laceration occurs in an individual previously injected with either alum precipitated or fluid tetanus toxoid, a stimulating reinjection with fluid tetanus toxoid is to be preferred to one with alum precipitated toxoid because the rise in antitoxin is more rapid.

Roentgen Therapy of Interstitial Pneumonia.—Oppenheimer resorted to roentgen treatment in 36 children with interstitial pneumonia. The diagnosis was based on the presence of fever, cough and dyspnea associated with infiltration along and around the bronchi and bronchioles shown on roentgenograms, with absence of lobar and bronchopneumonic consolidations, and failure of the symptoms to respond to sulfonamide medication. As soon as the diagnosis was established, the patient was given one roentgen treatment. The dosage was determined by the age of the patient and the duration of the disease. The more recent the illness, the smaller the roentgen dosage, 45 to 55 roentgens being given to children about 2 years old, 25 roentgens to babies under 4 months and up to 60 roentgens to children over 5 years. The treatment was repeated with slightly larger doses (about 10 roentgens more) after twenty-four hours if fever, dyspnea and cyanosis had not subsided by that time. With small doses of roentgen rays rapid and consistent improvement of the clinical condition took place in 33 of 36 patients with interstitial pneumonia. Treatment with doses exceeding 100 roentgens during acute stages resulted in severe constitutional reactions.

Medical Annals of District of Columbia, Washington

12:417-454 (Nov.) 1943

- Meningococcal Carrier State. E. B. Schoenbach.—p. 417.
Malaria: Its Control and Treatment. O. J. Brown and E. M. Bingham.—p. 421.
Pandemic Influenza. T. Parran.—p. 425.
Causes of Persistent Fever Encountered in Sulfonamide Therapy of Pneumonia. J. G. M. Bullock and A. O. Tumen.—p. 428.
Ergot in Delayed Postpartum Bleeding: Preliminary Report. D. Deutschmann.—p. 434.

Minnesota Medicine, St. Paul

26:1039-1118 (Dec.) 1943

- Feeding the Child. R. E. Nutting.—p. 1039.
Preparing Child for School. J. Baker.—p. 1041.
Emotional Disturbances of Children in Wartime. H. F. Helmholz.—p. 1044.
Carcinoma of Lung. H. J. Moersch and W. S. Tinney.—p. 1046.
Use of Curare in Metrazol Treatment of Psychoses. E. W. Miller.—p. 1052.
Discovery of Pulmonary Circulation of Blood. M. Neuburger.—p. 1054.
Plasma and Serum Toxicity Due to A and B Substances. M. G. Levine and D. State.—p. 1056.
Problems Encountered in Explaining Certain Cases of Erythroblastosis Fetalis on Rh Theory. A. J. Hertzog.—p. 1057.
Successful Treatment of Extreme Allergy to Bee Body and Bee Venom. E. G. McLane.—p. 1061.
Common Duct Repair by Means of Vitallium Tube. J. M. Hayes.—p. 1064.
Reinfection with Pneumococcus Meningitis. H. I. Arbeiter and M. G. Levine.—p. 1065.

New Jersey Medical Society Journal, Trenton

40:413-452 (Nov.) 1943

- Factors in Peripheral Lesions Following Carbon Monoxide Poisoning. E. A. Seifert.—p. 418.
Tuberculosis Screening Examinations of Industrial Workers. M. H. Collier and W. H. MacDonald.—p. 421.

Ohio State Medical Journal, Columbus

39:1089-1180 (Dec.) 1943

- Blood Chemistry and General Practitioner. R. G. Lehman.—p. 1105.
Senile Psychoses and Psychoses with Cerebral Arteriosclerosis. J. J. Alpers.—p. 1108.
Recent Advances in Clinical Ophthalmology. J. E. L. Keyes.—p. 1110.
*Effects of Pyridoxine on Nausea and Vomiting of Pregnancy: Results of Treatment of 40 Patients. W. M. Silbernagel and O. P. Burt.—p. 1113.
Malignant Disease of Peritoneum. O. Berghausen.—p. 1115.
Vitamin K in Tonsillectomy Granulation Oozing. C. A. Campbell.—p. 1116.
Congenital Absence of Vagina. P. J. Reel.—p. 1117.
Urticaria and Angioneurotic Edema: Summary of Our Present Knowledge. M. B. Cohen.—p. 1120.
Silicosis. J. H. Skavlem.—p. 1123.
Heart Disease Secondary to Syphilitic Aortitis. R. H. Fuller and H. W. Ryder.—p. 1126.
Meeker Day on Midwifery. P. D. Jordan.—p. 1133.

Pyridoxine in Vomiting of Pregnancy.—Silbernagel and Burt used pyridoxine hydrochloride in the treatment of 40 patients with nausea and vomiting of pregnancy. Complete relief was obtained in 38 of 40 patients treated with intravenous injections. Ill effects were not noted. No other treatment was employed. All patients improved in six to twenty-four hours after the initial injection. The duration of the improvement was variable. Six patients with accompanying seborrheic skin lesions were greatly improved. It is suggested that nausea and vomiting of pregnancy may be due to hepatic glycogen deficiency, which may be caused by faulty fat metabolism. Pyridoxine hydrochloride may work through its corrective action on deranged fat metabolism.

Oklahoma State Medical Assn. Jour., Oklahoma City

36:461-506 (Nov.) 1943

- Some Clinical Observations on Coronary Sclerosis. W. Langston.—p. 461.
Interrelationship of Solid, Liquid and Gas Metabolism. E. G. Mason.—p. 467.
Control of Syphilis in Oklahoma Industry. D. V. Hudson.—p. 471.
County Health Department in Oklahoma. J. W. Shackelford.—p. 475.

Pennsylvania Medical Journal, Harrisburg

47:97-192 (Nov.) 1943

- Pennsylvania Emergency Maternity and Infant Care Program. P. Dadds.—p. 115.
Surgical Treatment of Bronchiectasis. H. A. Kipp.—p. 117.
Common Errors in Gynecologic Diagnosis. F. B. Nugent.—p. 124.
Aspects of Gallbladder Surgery. C. B. Rentschler.—p. 131.
Fat Meal—Its Value in Cholecystography. R. D. Bacon.—p. 137.

Southern Medical Journal, Birmingham, Ala.

36:709-780 (Nov.) 1943

- *Prothrombin Determinations in Acute Coronary Occlusions. H. M. Doles.—p. 709.
Trails and Trends in Abdominal Surgery. R. L. Sanders.—p. 714.
Sulfacetamide and Sulfadiazine Therapy in Urinary Tract Infections. E. P. Alyea and A. A. Parrish.—p. 719.
Kidney Operations in Renal Calculus. M. L. Boyd.—p. 723.
Relation of Conjoint Tendon to Permanent Cure of Inguinal Hernia. C. R. Robins.—p. 731.
Duplication of Terminal Ileum: Report of Case Associated with Two Congenital Diverticula. E. W. Grove and L. D. Porch.—p. 735.
Postabortal Tetanus: Successful Treatment with Dihydro-Beta-Erythroidine. E. G. Goodman and J. F. Reinhardt.—p. 737.
*Pellagra, Pernicious Anemia and Sprue: Allied Nutritional Diseases. S. Harris and S. Harris Jr.—p. 739.
*Peptic Ulcer Treated with Aid of Posterior Pituitary Extract. M. H. Metz and R. W. Lackey.—p. 747.

Prothrombin Determinations in Acute Coronary Occlusions.—Doles demonstrated that the prothrombin time is well below normal during an attack of coronary occlusion. Prothrombin determinations were carried out on all patients at the time of their first examination. One or more determinations have been made on 457 persons. Eight patients of this group developed acute coronary occlusion while under observation; 5 were not seen until after the occlusion had occurred. Prothrombin was determined in 13 patients before, during and after an acute occlusion. The occlusion did not occur in any of these patients until the prothrombin time was below 70 per cent of normal. Since a search of literature failed to show any instance of vitamin K being used in acute coronary occlusion, the use of this therapy was carried out with considerable care. In addition to close observations of these patients

for any unsatisfactory effect on the circulatory system, prothrombin determinations were made daily during the first fourteen days, twice a week until the end of the sixth week, and once a month after discharge from the hospital until the patient's vitamin K requirements were determined. It has also been a routine to make prothrombin determinations once every six weeks as long as the patient is under observation. Small amounts of vitamin K were given in the early stages, but as no harmful results were observed and more patients were investigated the doses both in amounts and frequency were increased. Of the patients whose prothrombin time was restored to normal limits shortly after the acute onset the convalescence was less stormy and the amount of myocardial damage resulting from the occlusion appeared to be considerably less. Although these observations suggest that vitamin K deficiency is a factor in the mechanism of acute coronary occlusion, this series is too small to permit definite conclusions to be drawn.

Pellagra, Pernicious Anemia and Sprue, Allied Nutritional Diseases.—The HARRISES maintain that pernicious anemia, pellagra and sprue are three separate and distinct disease entities; but there are many reasons for concluding that they are allied nutritional diseases. The oral and gastrointestinal symptoms in pellagra without skin lesions, pernicious anemia and sprue may be indistinguishable one from the other in cases in which there is macrocytic anemia. The most effective treatment in pellagra, pernicious anemia and sprue is liver and liver extracts. Nicotinic acid is an ingredient of liver and liver extract. Liver changes, usually fatty degeneration, is an almost constant occurrence in pellagra and pernicious anemia and to a less extent in sprue. Atrophy of the stomach and intestine may be found in all three diseases. If cord changes are found in pellagra, pernicious anemia or sprue, the lateral and posterior columns are involved. Liver insufficiency appears to be a factor in the genesis of pellagra, pernicious anemia and sprue. Cases are reported in which pellagra and pernicious anemia, pellagra, sprue and pernicious anemia existed in the same patients. This fact suggests common etiologic factors. The frequency of intestinal parasites in anemic patients with pellagra, pernicious anemia or sprue is mentioned with the suggestion that intestinal toxemia and liver insufficiency may be etiologic factors in some cases. The occurrence of pellagra in alcoholic addicts and the not infrequent complication of pernicious anemia in cirrhosis of the liver suggest that pathologic changes in the liver and/or liver insufficiency may be factors in alcoholic pellagra and pernicious anemia in patients with liver cirrhosis.

Posterior Pituitary in Peptic Ulcer.—METZ and LACKEY say that the idea that posterior pituitary might influence the healing of an ulcer presented itself when a few patients with the ulcer syndrome exhibited completely unexplained polyurias. The ulcer syndrome associated with an abnormality of water metabolism has been greatly benefited by posterior pituitary in the majority of cases, but polyuria is not a prerequisite for employing the substance. Experiments were carried out with both human beings and animals. These concerned three functional changes observed in this disease: gastric hypersecretion, gastric and duodenal hypermotility and hyperemia of the gastric mucosa. These alterations were seen to revert toward normal under the influence of posterior pituitary in a much more satisfactory manner than in patients who had only medical management. Nocturnal fasting gastric secretion and hypermotility were especially reduced. The diet consisted of only three meals daily with milk once between meals and at bedtime. The diet would satisfy all protein, mineral and vitamin requirements and it omitted only the obvious irritants and most indigestible foods, as fried ones, coarse vegetables and pastries. Along with posterior pituitary the patients were given an effective antacid and also an antispasmodic drug for about the first two weeks of care. Satisfactory clinical results are reported in 311 cases, or 74 per cent of the entire series of 418 unselected cases of peptic ulcer treated with the aid of posterior pituitary. Intranasal insufflation of desiccated posterior pituitary powder has proved to be the most dependable means of administration. It is emphasized that this hormone should be considered as a supplement to the rational medical management of patients with uncomplicated peptic ulcer.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Archives of Disease in Childhood, London

18:113-160 (Sept.) 1943

Some Recent Virus Work and Its Practical Import. S. P. Bedson.—p. 113.

Studies in Anemias of Infancy and Early Childhood: Part XIV. Fate of Transfused Erythrocytes. H. S. Baar and T. W. Lloyd.—p. 124.

*Head Injuries in Children and Their After-Effects. E. Guttman and H. Horder.—p. 139.

Fibrinogen Deficiency as Factor in Hemorrhagic Disease. E. C. Allibone and H. S. Baar.—p. 146.

Head Injuries in Children.—Guttman and Horder show that children form a considerable proportion of admissions to an accident service. Observations on 60 children with head injuries indicates that the incidence of these injuries was higher in summer than in winter. Boys were more numerous than girls. Two thirds of the cases were due to road accidents. The intelligence of the children was average and did not indicate their accident liability. Fractures of the skull were more frequent than among adults. In the acute stage emotional symptoms were more impressive than clouded consciousness and intellectual loss. The incidence of headache did not differ much from that in adults. Two thirds of the patients were fit for discharge after two weeks' treatment in the hospital. The absence from school due to the accidents was two to seven weeks in half of the cases, less in one fourth and more in one fourth. The postconcussional syndrome was observed in 10 per cent of the cases; its incidence depended to a large extent on environmental factors. Irritability was the most common after-effect. Persistent behavior disorder was rare, as also was intellectual impairment.

Lancet, London

2:593-624 (Nov. 13) 1943

Orthopedic Influence on Treatment of Fractures: Clinical Study. G. R. Girdlestone.—p. 593.

*Effect of Altitude on Cases of Pneumothorax. G. S. Todd, with comments on electrocardiograms by D. M. Anderson.—p. 597.

Delayed Tuberculin Reaction. M. Daniels.—p. 600.

*Effects of Accidental Exposure to Mustard Gas Vapor. R. S. Aitken.—p. 602.

Retrograde Amnesia: Some Experiments. W. Mayer-Gross.—p. 603.

Resection of Small Intestine in Infant Three Weeks Old. K. J. Adams.—p. 605.

*Perforation of Rectum from Immersion Blast. P. G. C. Martin.—p. 605.

Effect of Altitude on Pneumothorax.—Todd and Anderson studied the effects of altitude on pneumothorax in the low pressure chamber. The subjects studied were 2 patients with rightsided pneumothorax, 1 of whom had a mobile and the other a partially fixed mediastinum; 2 patients with leftsided pneumothorax, 1 with a mobile and the other with a partially fixed mediastinum, and 1 patient with a rightsided pneumothorax, who had a bronchopleural fistula. X-ray examination on inspiration and expiration was carried out at different altitudes. Readings of vital capacity and analyses of samples of alveolar air were done on some and electrocardiograms were taken of 4 of the patients at different elevations. The authors conclude that, if possible, no patient with a wound of the chest causing pneumothorax should go above 4,000 feet if transported by air. If it is necessary to go to greater heights the pressure should be adjusted by removing as much air as possible before the start of the journey. In cases of tension pneumothorax due to escape of air through a lacerated lung it will be necessary to place a needle or an intercostal catheter in position in order to control the pressures during the flight. Pilots or passengers with an artificial pneumothorax should not fly by airplane at the most above 6,000 feet for any length of time and should on no account go above 8,000 feet. Those with a mobile mediastinum appear to stand altitude better than those with adhesions or a fixed mediastinum, in whom there is always danger of rupture of an adhesion. By removing most of the air before the ascent it is possible to allow the patient to fly higher; but expansion of a lung collapsed by artificial pneumothorax is likely to exacerbate the underlying disease. If a patient with artificial pneumothorax must undertake a flight up to 8,000 or 10,000 feet he should go just before a refill is due and not immediately after one.

Accidental Exposure to Mustard Gas Vapor.—Aitken reports observations on a number of soldiers who were accidentally exposed to an unknown dose of mustard gas vapor in their sleeping quarters. After from five to six hours of continuous exposure many men awakened with symptoms. They complained of painful watering eyes, photophobia and dimness of vision; some could not open their eyes. They had moderate to severe headache, mostly frontal, which lasted several hours or longer. They vomited, often repeatedly, for an hour or two and were dizzy. Their throats felt dry or, in a few cases slightly sore, and some of them felt constriction in their chests; they coughed. Castor oil drops were placed in their eyes. They were stripped, washed and transported to hospitals. Bright red erythema was present on faces and necks, the parts unprotected by clothing, sleeping bags or hair. Only in 1 case did vesicles appear. The erythema quickly faded, disappearing in three to six days and leaving neither discoloration nor desquamation. Discomfort in the eyes varied. The lids were edematous and red; some men were unable to open them on account of swelling. Those who could open their eyes had photophobia and dimness of vision. The conjunctivas were injected and the flow of tears was profuse. On admission 3 drops of 2.5 per cent sulfacetamide ("Albucid") solution was placed in every conjunctival sac. This was repeated two and four hours later. Thereafter for four days 2.5 per cent sulfacetamide ointment was applied between the lids twice daily, and for ten days the pupils were kept dilated with atropine. During the first two days swollen eyelids in close apposition were gently separated every hour or two to facilitate the escape of tears. Sulfadiazine was given for four days to persons showing rises of temperature, and sedatives for nocturnal cough. All the men, with the possible exception of 2, could have been regarded under active service conditions as fit for duty by the tenth day. No secondary infection developed in conjunctivas or lungs.

Perforation of Rectum from Immersion Blast.—Martin reports the case of a seaman who was thrown into water when a cruiser was torpedoed. A depth charge exploded near him. On admission to the hospital fourteen hours after the torpedoing the patient showed no external signs of wounding. He was complaining of severe lower abdominal pain, worst in the right iliac fossa. He was passing a small amount of bright red blood from the anus. The abdomen was rigid all over, more especially in the right iliac fossa. A laparotomy was performed, and pus was seen in the peritoneal cavity. The first part of the rectum on its anterior surface showed a lacerated bruised perforation about 1 cm. in diameter. The perforation was oversewn and buried with a purse-string suture. The abdominal contents were rapidly searched for any further injuries, but none were found. A pelvic colostomy with a long spur was made. The pelvis was drained and the abdomen closed. A blood transfusion was given. On the third day paralytic ileus became evident. Duodenal drainage, intravenous drip and small repeated doses of morphine were of no avail, and the man died fifty-two hours after operation. Necropsy revealed general peritonitis.

Archiv für Kinderheilkunde, Stuttgart

126:161-208 (Aug. 28) 1942. Partial Index

- Surgical Treatment of Renal Tumors During Childhood. W. Schäfer.—p. 161.
 Sympathogonioma in a Newborn Infant. Olga Brauner.—p. 174.
 Eosinophilia in Scarlet Fever with Particular Attention to Eosinophilia of Skin. K. Demel.—p. 177.
 *Treatment of Pleural Empyema in Childhood. Karoline Valentin.—p. 190.
 *Intrauterine Transmission of Measles: 2 Cases. K. Hofer.—p. 194.
 Pneumonia in Prematurely Born Infants. H. Muralter.—p. 198.

Treatment of Pleural Empyema of Childhood.—In addition to surgical treatment and chemotherapy, blood transfusions are valuable for pleural empyema. Valentin reviews observations on 159 children with pleural empyema. Thirty-six of these were infants less than 1 year of age, 67 were between 1 and 3 years old and the remaining 56 were over 3 years of age. A comparison of the recovery and death rates of the 53 who received blood transfusion with the 106 who did not discloses that in the 53 treated with transfusion the death rate was 22.6 per cent, whereas in the 106 without transfusion it was 39.6 per cent. The efficacy of transfusion was particularly noticeable during the first two-years of life.

Intrauterine Transmission of Measles.—Hofer reports 2 cases of intrauterine transmission of measles. In the first case the transmission must have taken place during the preexanthematic stage, because the mother developed the measles rash during birth, while the infant developed the rash on the eighth day of life. In the second instance the mother exhibited the rash on the third day after delivery and the infant on the tenth day of life. The first child was treated with maternal blood, the second with convalescent serum. The course was short and mild in both cases, and there were no complications.

Archiv für klinische Chirurgie, Berlin

203:343-530 (Aug. 20) 1942. Partial Index

- Bleeding Ulcers of Stomach and of Upper Intestine. H. Gotenbruck.—p. 343.
 *Development of Gastric Carcinoma from Gastritis and Inflamed Polyps? H. Westhues.—p. 391.
 Surgical Significance of Misplacement of Colon Between Liver and Diaphragm. R. Felkel.—p. 436.
 *Treatment of Exophthalmic Goiter and of Toxic Goiter. L. Rathcke.—p. 449.
 Treatment of Open Pneumothorax. K. Kuhlmann.—p. 468.
 Familial Occurrence of Bilateral Renal Calculi. L. G. Vogt.—p. 474.
 Lesions of Acetabulum During Childhood. Z. Mester.—p. 486.

Development of Gastric Carcinoma from Gastritis and Polyps.—Konjetzny believes that approximately 85 per cent of all gastric cancers develop on the basis of gastritic mucosal changes. Westhues, on the basis of 463 resected stomachs and 40 stomachs obtained by necropsy, concludes that inflammation is not the decisive factor in the development of gastric cancer. The blastomatous gastric polyps, which are definitely precancerous in nature, are likewise not of inflammatory nature, and cancers developing from them are not the result of inflammation. He does not deny the possibility of development of cancer on the basis of gastritis. His view differs from that of Konjetzny more quantitatively than qualitatively. However, this difference plays a decisive role in treatment because, if Konjetzny's views are correct, preventive resection would be justified in gastritis. If, however, cancer develops only in exceptional cases on the basis of a gastritis, preventive resection is not indicated. Konjetzny himself is very moderate in his demand for preventive resection. His therapeutic views contradict his theoretical reasoning to a certain extent. The greater incidence of gastritis in recent years has not increased the incidence of gastric cancer. Prophylaxis is still mainly a question of early diagnosis and prompt treatment of the gastric cancer.

Exophthalmic and Toxic Goiter.—Rathcke designates as toxic those forms of goiter which on microscopic examination do not show epithelial proliferation and liquefaction of colloid but which show transitional microscopic changes. Exophthalmos and other ocular signs are absent, but other symptoms, such as motor unrest, acceleration of the pulse rate, loss of weight and considerable increase in the basal metabolic rate, are present. A patient's general condition is of greater importance for the determination of the optimal time for operation than the basal metabolic rate. The thymus plays a decisive part in the development of coma. The thyroid and the thymus have an antagonistic or compensatory function. When the thyroid is removed there is no longer the inhibitory action on the thymus. Medical treatment is justified in exophthalmic goiter. When rest and forced feeding prove ineffective, the patient should be referred to a surgeon. Roentgen therapy is not always effective and may make the later operation more difficult. Damage to the parathyroids has been observed after irradiation. This report is based on 97 patients with exophthalmic or toxic goiters. The mortality rate of 19 per cent is high, but some patients were already in coma when they arrived at the surgical clinic. Fourteen of the 19 patients who died had thymus involvement. Two stage operations were tried, but a comparison of the results reveals no advantage over the one stage operation. Adequate preoperative treatment is of the greatest importance. Surgical treatment consists in bilateral resection of the thyroid. Iodine medication, if necessary by the intravenous route, is resumed immediately after operation. Dextrose infusions are given to counteract the harmful effect of the thymus on the cardiac and hepatic glycogen. They also influence the elimination of toxic substances. For threatened coma a transfusion is given immediately after the operation.

Book Notices

Human Gastric Function: An Experimental Study of a Man and His Stomach. By Stewart Wolf, M.D., Captain, M. C., A. U. S., and Harold G. Wolff, M.D., Associate Professor of Medicine, Cornell University Medical College, New York. With a foreword by Walter B. Cannon, M.D. Cloth. Price, \$4.75. Pp. 195, with 42 illustrations. New York, London, Toronto: Oxford University Press, 1943.

Two Beaumonts found another Alexis St. Martin, and this is the report of their studies. It is an immensely more readable, interesting and useful book than the "Experiments and Observations" of 1833, but then, few men are so gifted as to see more than they have been prepared to see by the training they have gotten from books, teachers and contemporary writings. Beaumont was interested most in how digestion took place: in how the stomach contracted, and in the composition of the gastric juice. Wolf and Wolff, living in an age when physicians are much interested in the causes of ulcer, in psychosomatic medicine and in gastritis as seen through a flexible gastroscope, were much interested in the ulcer which they were able to produce and later to heal, in the changes in the appearance of the gastric mucosa which were associated with emotional storms, in the great increase in gastric acidity which came whenever their temperamental Irishman became worried, annoyed or outraged and in the changes resembling those of hypertrophic "gastritis," which sometimes came and went within a time interval of minutes.

The book is full of thought provoking material, and any internist who hopes to stay well educated cannot afford to pass it by. Probably no other work throws so much light on the factors which cause an ulcer to flare up and become active or painful or intractable. All psychologists and all intelligent laymen can find much of interest in the remarkable story told by Wolf and Wolff. If their book had been written a hundred years ago, when research was rare and facilities for carrying it out few, it would certainly have gone down in history as one of the greatest of medical classics. Perhaps even today, when good research is being done in scores of laboratories, the excellence and significance of this little book will be widely recognized and never forgotten.

Synopsis of Tropical Medicine. By Sir Philip Manson-Bahr, C.M.G., D.S.O., M.D., Senior Physician to the Hospital for Tropical Diseases, Royal Albert Dock and Tilbury Hospitals. Cloth. Price, \$2.50. Pp. 224, with 5 illustrations. Baltimore: Williams & Wilkins Company, 1943.

As the name implies, this is essentially a condensation of the author's well known textbook on tropical diseases. The material is compressed into a small volume and contains an immense amount of information. It is inevitable that a book of this character, in which all discussion is eliminated, will contain statements with which other authorities disagree. It is likewise inevitable that certain inaccuracies should be present. Generally speaking, the author has accomplished very successfully the objectives set forth in the preface, to provide a guide to tropical medicine in a condensed form suitable for medical officers in the armed forces.

In the discussion of malaria the statement that the sporozoites enter erythrocytes is not established, and the statement that *Anopheles gambiae* has extended far into Brazil is not in keeping with the recent report of the elimination of this vector. He fails to include *Anopheles quadrimaculatus* as a vector in the United States and does include it in the Caribbean area, where it is not existent. The use of the term "trypanosome chancre" in the discussion of African sleeping sickness is not a happy one. The section on the diagnosis of intestinal amebiasis leaves the reader with the impression that ulcers are usually visible on sigmoidoscopy of all cases, and the statement that *Endamoeba histolytica* may become emetine fast is not proved nor, in fact, is there any convincing evidence that this may occur. The high opinion of emetine bismuth iodide as a therapeutic agent is not shared by clinicians in this country who are familiar with the extreme intolerance of patients of this preparation.

The statement that the relapsing fevers in North America are louse borne is incorrect, as is likewise the statement that plague is endemic in the southern part of the United States. The discussion of brucellosis omits the extremely important chronic form so commonly attended by severe and long drawn out

physical disability and neurasthenia. Experience in the United States, moreover, has not indicated that any of the sulfonamides are of value in treatment. In the description of cholera it is said that the vibrios may be recovered from the blood, kidneys and spleen. This is in contradiction with all authorities, who are uniform in the statement that the organism is never encountered in the blood or tissues. Nicotinic acid is said to be specific for the treatment of sprue without mention of the value of unrefined liver extract. This is a serious omission. In the consideration of the geographic distribution of *Schistosoma mansoni* it is not listed as occurring in Puerto Rico. Despite these discrepancies and others of similar types, there is no doubt that this volume constitutes an excellent attempt to meet a real need. It is far and away the best publication of its type.

Oral Diagnosis with Suggestions for Treatment. By Kurt H. Thoma, D.M.D., Professor of Oral Surgery and Brackett Professor of Oral Pathology, Harvard University, Boston, with contributions by Fred Trevor, D.M.D., Instructor in Oral Pathology, Harvard Dental School, Henry Goldman, D.M.D., Instructor in Oral Pathology, Harvard School of Dental Medicine, and David Welsberger, D.M.D., Associate in Clinical Dentistry, Harvard School of Dental Medicine. Second edition. Cloth. Price, \$6.75. Pp. 495, with 666 illustrations. Philadelphia & London: W. B. Saunders Company, 1943.

This is a complete revision of *Oral Diagnosis and Treatment Planning*, as the latter title was misleading and misunderstood by those not in contact with new developments in dental education. The arrangement of material in this book facilitates diagnosis, but the practitioner is equally concerned with treatment, especially new ideas and methods. Thus an attempt has been made at the end of each chapter to outline some of the prevailing methods of treatment especially for those diseases not frequently seen or for which new remedies have been suggested. General health is analyzed for cooperation between dentist and physician. In part I special methods of examination are discussed and treatment planning from a broad point of view only. Part II deals with the special diagnosis of dental and oral diseases and suggests treatment procedures. Classification has been arranged from an anatomic point of view, with subdivisions based on the most evident symptoms rather than etiologic factors. This should lead the diagnostician from the obvious to the more obscure changes, from many possibilities to a small number, from the conditions visible to the eye to those discoverable only by the process of differentiation and elimination, should envisage significant possibilities and should put diagnosis on a sound basis. Examination should not be restricted to the complaint needing immediate attention. A complete checking of the teeth, jaws and oral structures represents a real health service. The effect of certain general disorders on the outcome of the treatment of dental and oral diseases must be considered to a greater extent than heretofore. Metabolic disturbances, blood dyscrasias and infectious diseases should be considered, when present, in planning treatment. If the general practitioner is not prepared to undertake extensive investigation, it is his duty to recommend the services of a consultant for diagnosis or treatment or both. This is an excellent book and should be close to the student and graduate alike at all times.

A Hundred Years of Medicine. By C. D. Haagensen and Wyndham E. B. Lloyd. Cloth. Price, \$3.75. Pp. 443. New York: Sheridan House, Inc., 1943.

This book is designed primarily for the layman, and for students of medicine and practitioners who have not found time for an extensive study of the history of medicine.

Some knowledge of the course of political history is essential to our evaluation of contemporary events, and this is equally true in medicine. Well intentioned proposals and theories in medicine are frequently recognizable as unsound when viewed against the historical background of their special subjects, and the importance of a historical point of view for the layman as well as for the medical student is emphasized by each increase in the complexity of the medical curriculum and practice. It may also be observed that medical history is inextricably conditioned by political and economic history. Many of our current problems of medical economics are not primarily medical but are part of the changing economics of our times.

Haagensen and Lloyd present a short review of the principal events in medicine grouped under topics such as the germ

theory, orthopedics, thoracic surgery, surgical shock, tuberculosis and pernicious anemia, to mention a few at random. In part I the development of medicine up to a century ago is summarized as a background of contrast for part II, which reviews under selected topics the progress and growth of medical knowledge. In part III the progress of surgery is similarly described.

The new social aspects of medicine are outlined in part IV. The central problem is "how best to utilize our vast armamentarium of medical knowledge for the benefit of society. . . . In forming an opinion on this complex question, the reader should keep in mind that physicians as a class are as idealistic today as they were in our grandfathers' time, and that there are a great many of them who would welcome any practical plan for improving the organization of medical care. Unfortunately, the problem is not an easy one." And, it might be added, the problem cannot be solved by the socialization of medicine with its resultant decrease in efficiency of treatment by state paid and controlled doctors.

Reforms in American medical education, the growth of hospitals as centers of medical teaching and the increasing tendency toward specialization are well dealt with. "It is no longer possible to learn everything in medicine. . . . No wise physician is ignorant, however, of the truth that the practice of medicine, whether it be in the peasant cottage or in the towering medical center, depends first of all on the use of sound common sense. A broad general knowledge of the 'face of disease' is equally essential. . . . And the specialists who have added most to modern medicine have with few exceptions possessed good hospital training in general medicine or surgery before they narrowed their attention to one phase of medicine."

National schemes of medical practice and of group practice are briefly discussed. Some forty illustrations, including portraits and figures of historical interest, will help to fix facts in the mind of the reader. A good bibliography and an index are added. This book is well arranged and well written. It will be a source of correct information for the layman and a stimulus to further historical study to the young physician.

Fractures and Dislocations for Practitioners. By Edwin O. Geckeler, D. Third edition. Cloth. Price, \$1.50. Pp. 361, with 320 illustrations. Baltimore: William Wood & Company, 1943.

The subject matter is efficiently and concisely condensed in this book. The physiology and mechanism of bone repair are described. The fundamentals concerning the examination, diagnosis, records, medicolegal aspects, complications of fractures and dislocations and the organization of fracture services are described. The chapter on emergency treatment includes the modern basic concepts. The principles of débridement of compound fractures and the detailed description of technic are very important for industrial surgeons and medical men of the armed forces as well as for general practitioners. Essential general points in reduction, immobilization, traction and follow-up treatment are described. A detailed plan for determining disability, essential in industrial and medicolegal cases, is described. Regional fractures are discussed in succeeding chapters, followed by several chapters on general considerations and specific description of the reduction and treatment of dislocations. The reader must be impressed with the well chosen illustrations, clearly reproduced. This book is of value to students and practitioners as well as to orthopedic surgeons and medical men of the armed forces.

Gastro-Enterology (In Three Volumes). By Henry L. Boekus, M.D., Professor of . . . University of Pennsylvania Graduate School of . . . Volume I: The Esophagus and Stomach; . . . and Diagnosis and Treatment of Disorder. . . . Stomach, Including Duodenal Ulcer. Cloth. Price, \$12; \$35, per set of three volumes and Index. Pp. 831, with 131 illustrations. Philadelphia & London: W. B. Saunders Company, 1943.

This is the first of a set of three volumes to be devoted to gastroenterology under the authorship of a recognized leader in the field. The scope of volume I includes the examination of the patient, the anatomy and physiology of the esophagus and diaphragm, together with the conditions which affect them, and then a section on disorders of the stomach which could more properly have been called disturbances or diseases of the stomach, providing hundreds of pages on anatomy and physi-

ogy, disorders of secretion, gastritis, duodenal and peptic ulcer, carcinoma and other tumors, syphilis and other infections, and anomalies. The author recognizes that gastroenterology is one department of internal medicine and the necessity for thorough training in internal medicine before gastroenterology is adopted as a specialty. The space devoted to psychogenic factors in the considerations of symptomatology is quite inadequate in the light of modern points of view; nor is there much added in relationship to psychosomatic factors in the consideration of ulcer of the stomach and duodenum. The volume is impressive by the vast amount of material that it contains, and its practicality is immensely enhanced by the selection of excellent reports of cases. The colored pictures, which are numerous, and the quality of the illustrations generally also add greatly to the usefulness of this work. Subsequent volumes are to deal with the small and large intestine and the peritoneum, and the final volume on the liver, biliary tract and pancreas and secondary gastrointestinal disorders.

Pain Mechanisms: A Physiologic Interpretation of Causalgia and Its Related States. By W. K. Livingston, Lieutenant Commander (MC), U.S.N.R. Cloth. Price, \$3.75. Pp. 253, with 26 illustrations. New York: Macmillan Company, 1943.

The subject matter of this monograph is of great complexity and controversy. It is quite an impossible task to present the material in the scientific language of the research worker in the fundamental sciences and at the same time make it acceptable to the clinician. The author compromises by recording the impressions derived from the work of many investigators and his own observations over a period of years. In section I the author provides his background for the book by including some of the anatomy and physiology of pain conduction, touching on the psychologic aspects of sensory perception and timorously invading the field of the neurophysiologist. Section II deals with the clinical aspect of pain and especially the study and interpretation of causalgia and its related states. He includes brief but well organized discussions on post-traumatic pain syndromes, chronic low back disability, facial neuralgias and phantom limb pain. In an effort to explain the mechanism responsible for these states he has presented certain findings that should hold practical importance in the treatment of the many cases which will most likely result from the present war. Having set forth this concept of pain, the author devotes section III to the interpretation of its possible mechanisms which have influenced his own approach to clinical problems. There are no final conclusions to be drawn from this study of pain mechanisms. The author does state a few convictions, but his impressions are too plastic to be called conclusions.

The Health of Children in Occupied Europe. International Labour Office. Paper. Price, 25 cents; 1s. Pp. 37. Montreal, 1943.

Under the auspices of the International Labour Office there comes from Montreal a report on the health of children in occupied Europe. The pamphlet first discusses the conditions from the point of view of dietary standards, reduction of rations and general living conditions, then considers the consequences in relation to the spread of disease, the rise in the death rate and the psychologic and social effects and finally draws some conclusions. The conclusions are, briefly, that the present conditions are bound to result in general deterioration of the physical and moral strength of the people, with depopulation. It is emphasized also that one of the primary tasks of the United Nations, when victory has been won, will be to bring immediate relief to the underfed and devitalized peoples of Europe. Unless this is done, the ultimate deterioration of all the people of the nations now occupied by the Nazis will in the end lead to the very domination that the Germans have fought for, regardless of who may be said to have won the war.

English-Spanish—Spanish-English Dental Vocabulary Including Many Medical Terms. By Joseph S. F. Marie. Cloth. Price, \$4. Pp. 159, with illustrations. Lancaster, Pennsylvania: Jacques Cattell Press, 1943.

Without any attempt to provide definitions, this book gives in English-Spanish and in Spanish-English all the terms used in dentistry and a good many that are used in medicine. The increasing scope and quality of dentistry in the South American republics should earn for this book a suitable circulation.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

NOCTURNAL CRAMPS IN LEGS

To the Editor: Is anything definite known of the etiology, pathology and treatment of "old age" cramps? The patient may make a quick movement in bed at night and is seized with cramps in the legs, feet or toes. I treated a patient who complained of these cramps recently, on a strictly empirical basis, by prescribing 100 capsules of adrenal cortex liquid. In one week the cramps ceased and have not reappeared. Since this remedy gives support to only the adrenal glands, I am wondering if they play any etiologic part in the production of the cramps.

T. H. Standlee, M.D., Mirando City, Texas.

ANSWER.—Nocturnal cramps in the lower extremities, occurring during bed rest and frequently awakening the patient, are not limited to the senile. They occur fairly frequently in pregnant women, especially during the second half of pregnancy. They also may be most annoying to relatively young men and women. The usual phenomenon is muscular spasm with intense discomfort, not dissimilar to the cramps occurring in swimmers and especially in those exerting themselves violently (ineffective, poor or panic stricken swimmers) in cold water. The episodes are closely related both in their subjective distress and in their pathogenesis to the painful attacks in intermittent claudication (Wright, I. S., chapter 30, *Arteriosclerosis*, in Stieglitz, E. J.: *Geriatric Medicine*, Philadelphia, W. B. Saunders Company, 1943).

Investigations into the etiology, pathogenesis and therapy of these cramps are continuing and our present concepts must be considered as tentative working hypotheses rather than final and dogmatic explanations. The basic mechanism seems to be a relative histanoxia of the muscle tissue. The studies of Sir Thomas Lewis and his associates (Lewis, Thomas; Pickering, G. W., and Rothschild, P.: *Heart* 15:359 [July] 1931) indicated a close parallelism between these phenomena and the pain of angina pectoris. If at a certain level of work (metabolic demand) the oxygen available is insufficient, pain arises. Either reduction of the demand, as in arresting effort in intermittent claudication or angina pectoris or improvement of the tissue respiration by increasing the blood supply (vasodilators in angina pectoris) brings relief. There is some evidence that accumulation of metabolic debris from the working muscle may be the specific mediator in inducing pain. Lewis discusses this P (pain) factor in detail. Histamine has been suspected as the P factor, but more recent studies tend to incriminate lactic acid and especially potassium ion (Harpuder, Karl, and Stein, Irwin D.: *Am. Heart J.* 25:429 [April] 1943).

The clinically significant fact is that such cramps arise when the tissue respiration is interfered with, usually as a result of an inadequate local circulation. Two factors other than histanoxia are also clinically significant: the availability of dextrose to the muscle fibers and the concentration of calcium in the blood. Hypoglycemia may induce attacks of angina pectoris; oxygen is relatively useless to working muscle cells unless there is enough dextrose to be oxidized and insulin to catalyze the reaction. This factor is particularly prominent in the pathogenesis of painful muscle cramps in older persons. Elderly diabetic patients do not do well on regimens which are too rigid and in which the blood level of dextrose is kept low; the frequency of anginal attacks is then greatly increased. It must not be forgotten that the longest interval between feedings is at night and that with age the homeostatic mechanisms maintaining the level of sugar in the blood become less and less effective.

Frequently depletion of the blood calcium is associated with a tendency to nocturnal muscle cramps and spasms. Most of these patients admit that they consume almost no milk, the major dietary source of calcium. The hypocalcemia observed in hypoparathyroid tetany is well known. The adrenal secretions are also involved in the control of muscle tone. During the second half of gestation there is a considerable drain on the maternal calcium because of the rapid growth of fetal bone. Oral administration of calcium will in many instances greatly diminish or wholly arrest these recurrent and distressing cramps.

In the elderly, nocturnal cramps are most likely to be associated with impaired circulation due to arteriosclerosis or vascular spasm, with some possibility of nocturnal hypoglycemia as a contributory factor. Though it is commonly assumed that external heat improves the peripheral circulation and that there-

fore the quiet warmth of the bed should prevent rather than enhance the occurrence of muscular histanoxia, recent studies have convincingly demonstrated that heat increases the metabolic needs, whereas refrigeration decreases the metabolic level, so that if a limb is kept cool a poor circulation may be adequate (Bowers, W. F.: *Mil. Surgeon* 93:289 [Sept.] 1943). It is thus perfectly feasible to consider that the warmth of the bed may contribute to the occurrence of such cramps.

Therapy should wait on as precise a diagnosis as possible. Study of the circulatory efficiency of an extremity, x-ray films to reveal calcification of the major arteries, determination of the fasting blood sugar and blood calcium concentrations should precede the outlining of a therapeutic regimen. When these factors are properly evaluated, correction of the physiologic imbalance is rarely difficult.

MORPHINE AND EPINEPHRINE IN SHOCK

To the Editor:—Is morphine sulfate, administered intravenously, indicated in traumatic shock? If so, in what doses? In what dilution should epinephrine in plasma be injected to combat traumatic shock? Should 1 cc. of 1:1,000 solution of epinephrine be diluted in 500 cc. or in 1,000 cc. of plasma?

Albert Borges, M.D., Endicott, N. Y.

ANSWER.—Relief of pain is one of the primary principles in the treatment of traumatic shock. The usual procedure is to administer $\frac{1}{4}$ or $\frac{1}{2}$ grain (0.016 or 0.032 Gm.) of morphine sulfate subcutaneously. The intravenous route in the administration of morphine has been little used, but according to the available evidence reviewed by Presman and Schotz (*Anesthesiology* 4:53 [Jan.] 1943) it offers quicker relief of pain without eliciting undesirable reactions. However, in traumatic shock—and for that matter, in any type of shock—due consideration should be given to the possible harm which may result from the powerful depressant action of the drug on the respiratory center. Anoxia is one of the major factors in the production and probably in the determination of irreversibility of shock. Until more evidence has accumulated that the intravenous administration of morphine in shock does not cause any higher degree of respiratory depression than that caused by an equally effective dose of morphine injected subcutaneously, the latter route should be advocated.

The administration of epinephrine in shock is a common mispractice based on the fact that the most apparent immediate effect of this drug is a rise in blood pressure. This effect, the result of arteriolar constriction, is rapidly followed by a secondary prolonged lowering of blood pressure due to generalized capillary dilatation. Both actions are aggravating factors in shock, in which there already exists a maximal reflex arteriolar contraction with universal capillary dilatation. In fact, a slow intravenous infusion of epinephrine has been shown to produce in normal animals a picture similar to shock (Bainbridge, F. A., and Trevan, J. W.: *Brit. M. J.* 1:381 [March 24] 1917 and Cannon, W. B.: *Ann. Surg.* 100:704 [Oct.] 1934). Therefore it cannot be too much stressed that the use of epinephrine in shock is contraindicated.

HAZARDS TO SKIN OF ULTRAVIOLET THERAPY

To the Editor:—During a lecture on electricity given at this station recently by Mr. Irwin Moon of the Moody Bible Institute a question arose which you may be able to clarify for us. Mr. Moon declared that the use of ultraviolet rays can be harmful to the user and often causes ulcers of the skin. This statement naturally made a strong impression on a number of men on the station whose work involves the use of ultraviolet, and it was thought that if we could publish a statement in refutation it would do much to improve the morale of the men affected. Any additional information which you are able to supply us in this matter will be greatly appreciated.

MC, U.S.N.R.

ANSWER.—Like most therapeutic methods of value, light therapy is not fool proof. Some human skins cannot react to light by tanning but simply burn or at best become freckled. Such skins, after years of exposure to strong sunlight as necessitated by certain outdoor occupations, may develop epitheliomas which are prone to ulcerate. But artificial light can hardly be accused of this injury, for there is no reason why any one should be subjected to artificial ultraviolet light in such a way as to cause epitheliomas even in susceptible skin. The lamps used for illumination in industrial plants are made of glass, which cuts out the ultraviolet rays. Those who work with therapeutic lamps can protect themselves easily. These injuries are effected only by constantly recurring irritation over long periods.

The danger of excessive exposure to sunlight of normal persons is common knowledge, but people often fail to realize that ultraviolet lamps used in excess may have similar effects. Cases of severe dermatitis and illness resembling sunstroke are too frequently seen in persons who attempt to use ultraviolet light

without proper instruction or who fall asleep under the light. An extreme example is quoted by Paul E. Bechet (*Common Sense Under the Sun, Hygeia* 20:507 [July] 1942). A woman aged 42 received a great overdose of ultraviolet light. Not only did she suffer a severe dermatitis, but ulcers developed in the gastrointestinal tract just as they do in some severe heat burns, and the patient died on the twelfth day. Such cases are useful warnings against self treatment without full instructions and all precautions.

Attendants who work under ultraviolet light as in rooms lighted from the ceiling receive small doses of light because of the distance of the lamps. Beginning with such mild dosage the skin becomes accustomed to the light and gradually acquires resistance. The dose of light for the patient must be determined by the physician, who can rule out the cases of hypersensitivity and, knowing the output of the lamp, can estimate the response to the rays of the portion of the skin to be treated. Careful measurement of distance and accurate timing are essential. No lay person should attempt to treat himself without the advice of a physician, thorough instruction in the management of the lamp and adequate precaution against falling asleep under the light. An alarm timer or an automatic cutoff timer will furnish such protection. With proper use of the lamp there need be no fear of harm from actinotherapy.

X-RAY MOTTLING OF LUNGS FROM IODIZED POPPYSEED OIL

To the Editor:—In 1931, while a resident in the hospital, a doctor inhaled a quantity of lipiodol and then was x-rayed. He was not x-rayed again until he was inducted into the Army, at which time his film was interpreted as normal. About one year later during a routine examination his x-ray film showed what was immediately diagnosed as typical pneumonia in both bases. Subsequent films during the next four months showed little if any change. Just yesterday his induction film was obtained and there is little difference in the appearance of the bases in that as in present ones taken sixteen months later. These films have been seen by several competent roentgenologists, and they have concurred on the diagnosis of a typical pneumonia. The patient is and always has been symptomless. Is it possible for the iodized oil to be absorbed and for it to produce a tissue reaction such as seen in silicosis? I would appreciate any information on tissue reaction from iodized oil and any suggestion as to what this pneumonitis might be and whether any further investigation is warranted.

Captain, M. C., A. U. S.

ANSWER:—Iodized oils instilled into the bronchi for purposes of bronchography may frequently be visualized on x-ray examinations indefinitely as a fine mottling in both pulmonary bases. The major portion of the oil is coughed out of the bronchi within a few minutes to a few hours. However, very small droplets which reach the periphery are phagocytized and apparently produce no reaction, although their presence is apparent roentgenologically. Oils which are chemically unsaturated, such as cod liver oil, or the paraffin base oils, such as mineral oil, do produce reactions known as "lipid pneumonia" and paraffinomas. The chemically saturated oils, such as lipiodol, which is iodized poppyseed oil, apparently produce no tissue reaction. With the complete lack of symptoms of the patient described, it would appear that the supposed pneumonitis is simply the finely divided lipiodol residue and that no further investigation is warranted.

IMMUNE GLOBULIN AND ANAPHYLACTIC SHOCK

To the Editor:—A girl of 5½ was given 2 cc. of immune globulin two weeks previous to the time of exposure to a case of measles; subsequently she developed measles and on the second day of the disease she was given 2 cc. more of immune globulin. Two hours after the injection she had a severe chill, let out a frantic scream and lapsed into a coma within an hour, her temperature being about 101 F. Despite heroic measures, adrenalin, oxygen, and the like, she died nine hours after the onset of the reactive symptoms. Were the reactive symptoms due to allergy? Do the symptoms suggest an acute encephalitis? What further treatment would have helped? How can one foretell if immune globulin will sensitize the patient to a subsequent injection? Captain, M. C.

ANSWER:—The description of this case indicates that death was due to anaphylactic shock. Although there was probably hyperemia of the brain, the duration of illness seems too brief to justify a diagnosis of acute encephalitis. Pulmonary edema often develops in such cases; if it was present, atropine sulfate might have been useful. If there was cyanosis, a carbon dioxide-oxygen mixture could have been used instead of oxygen alone. Heart stimulants are sometimes required. Hypertonic dextrose may be of value. Also if possible it is well to apply a tourniquet above the site of the injected material that caused the reaction in order to check absorption. Calcium gluconate, often used for serum reactions, is likely to be disappointing. It seems extremely doubtful if there are any known measures which would have saved the life of the patient.

If injections of biologic substances are made at intervals not in excess of one week, severe reactions are of less frequent occurrence than when the spacing is much longer. One cannot foretell whether immune globulin will sensitize a patient to a subsequent injection. It should be of interest to know whether the child concerned had a history of allergy.

TRANSIENT HYPERTENSION - IN PUERPERIUM

To the Editor:—In connection with the obstetric work done by our service (Frontier Nursing Service) I have encountered an obstetric condition about which I can find no literature and which I have not encountered previously in any of my work or experience. The condition is that many women have had an apparently normal antepartum course with no evidences of toxemia, have a normal delivery and in their postpartum period develop a high systolic blood pressure (160-190) with a correspondingly high diastolic pressure, the onset being anywhere from the third day until the tenth day and the condition lasting from a few days to several weeks. These patients show no signs at all of toxemia, have no complaints and are apparently in normal health except for the unduly high blood pressure. Residual changes are not noted in the patients later. Can you give me any help in diagnosing more definitely the condition present, in finding any literature on the subject or in explaining the condition in any way?

James M. Fraser, M.D., Hyden, Ky.

ANSWER:—A moderate rise of both systolic and diastolic tension is common in recently delivered women. It has been but little studied, probably because the majority of obstetricians do not follow the postpartum blood pressure when it is not elevated antepartum. The wavelike rise usually begins about one hundred hours after delivery and is commonly coincidental with the onset of lactation. During the final month of gestation there is usually a gradual rise in the arterial tension associated with a moderate fall in the blood calcium concentration (Stieglitz, E. J.: *Arch. Int. Med.* 39:465 [April] 1927). Immediately after parturition the blood pressure falls and the blood calcium level rises correspondingly. The later rise of the blood pressure, often to levels considerably higher than those observed during pregnancy, coincides with the onset of lactation and a sharp, though transient, drop in the blood calcium concentration. This phenomenon occurs both in women with normal arterial tension and in those with preexisting hypertensive disease or toxemia of pregnancy (Adair, F. L., and Stieglitz, E. J.: *Obstetric Medicine, Philadelphia, Lea & Febiger, 1934, chapter 22*). It is quite probable that a previous calcium deficiency may exaggerate and/or prolong the postpartum rise. There is no evidence to suggest that this transient hypertension is a precursor to progressive hypertensive arterial disease.

VIRUS PNEUMONIA

To the Editor:—I have read with interest the reply to Dr. John D. Blackburn's inquiry concerning the management of virus pneumonia (*The Journal*, Nov. 13, 1943, p. 733). It is stated that "several observers, chiefly roentgenologists, state that roentgen therapy aids in shortening the disease, but in the absence of control cases this must be accepted with reserve." I should like to call attention to a study by Lieuts. Howard L. Correll and Irving I. Cowan (MC), U.S.N.R., in which an analysis of therapeutic results in 155 cases of primary atypical pneumonia was undertaken. The essential features of this investigation are summarized in the accompanying table. The patients were routinely given

Response to Various Forms of Treatment

Treatment	Num- ber of Pa- tients	Total Sick Days	Total Days of Fever	Total Clear by X-Ray Film	Days Clear by to Sick X-Ray Ther- apy	Days to Clear by X-Ray After Therapy
Routine *.....	72	11.8	6.8	23.4	...	...
Sulfathiazole.....	41	12.5	6.5	21.2	...	...
Sulfanilamide.....	10	11.8	6.4	20.0	...	...
X-ray treatment, acute cases.....	23	8.4†	3.8†	8.3†	3.0†	...
X-ray treatment of un- resolved pneumonia.	9	...	...	...	33.3†	4.0†

* Bed rest, symptomatic therapy.

† One patient who developed pleural effusion the day of therapy is the single failure to respond and is not included in the calculations of treatment results.

‡ Two of the 7 patients who failed to clear within one week of x-ray therapy are considered failures to respond and are not included in the treatment response data.

112 roentgens over the involved lobe, and this was repeated in twenty-four hours if a favorable response was not elicited. Two treatments were usually required. While this series of cases has not been subjected to statistical analysis there is a distinct clinical impression that roentgen therapy reduced the total sick days, the total days of fever and the days required to resolve the pneumonic lesion.

Albert Paul Krueger, Captain (MC), U.S.N.R., Berkeley Calif.

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STUDIES ON TRAUMATIC SHOCK

III. ANESTHESIA IN CLINICAL SHOCK

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One of the most serious decisions to be made by the military surgeon is the choice of anesthesia for the wounded and shocked patient who must undergo abdominal surgery. Such wounded men more often than not have a seriously reduced circulating blood volume or have received blood or plasma insufficient in quantity to replace lost plasma or blood adequately. With front line casualties it is altogether likely that the supply of blood or plasma will never be great enough to restore to normal the blood volume of wounded personnel, so that the surgeon will be forced often to operate on persons in true or borderline shock. This will be especially true for patients whose shock is caused by continuing concealed "internal" hemorrhage.

A detailed discussion of the merits or disadvantages of the several anesthetic agents that might be used in shocked patients is considered not in order in this report. Certainly experience in World War I did not settle the arguments of the relative merits of chloroform, ether or nitrous oxide anesthesia for the shocked soldier. A careful review of the British medical literature on the subject of the choice of anesthesia in clinical shock reveals that since the invasion of the Low Countries in May 1940 and the evacuation at Dunkirk there has been a lack of agreement on one or several anesthetic agents for shock patients.

Evans and Beecher¹ in 1941 reinvestigated the gaseous anesthetic agents in experimental shock. We employed the shock preparation that I² developed, namely shock produced in the unanesthetized dog by strangulation of a short loop of ileum. In twelve to fourteen hours such animals show evidence of shock, and plasma losses by the dye technic of 25 to 40 per cent. We considered the shock to be caused principally by reduced circulating blood volume. To these animals in shock was then administered ether, nitrous oxide, ethylene or cyclopropane; a surgical plane of anesthesia was maintained until the animal died. No other shock

factor, such as operation or further blood loss, was introduced into these experiments.

The results of such experiments indicated that, of the four gaseous anesthetic agents studied, cyclopropane or ethylene seemed to be the anesthetic agents of choice for shock individuals. The performance of shocked dogs under nitrous oxide was extremely poor (we thought anoxia and possibly vasodilatation was the cause), and the performance under ether was relatively much poorer than with either cyclopropane or ethylene. These studies formed the basis for Beecher's³ recommendation that "these two agents, if available, should, on the basis of present information, be ranked as first choice" for abdominal exploration of a patient in shock or approaching shock.

Recently in this laboratory we have investigated further this problem in well over a hundred experiments and have now included in these studies chloroform and intravenous sodium pentothal. Data so far secured indicate that if no operative procedure is carried out on the shocked animal while it is under the influence of the anesthetic agent, and the shock is produced by either severe muscle trauma or intestinal strangulation, cyclopropane performs admirably but is not superior to carefully administered intravenous sodium pentothal, even though the experiment is carried on as long as four to six hours. If resection of the strangulated loop is performed, cyclopropane appears to be superior to intravenous sodium pentothal.

Correspondence and discussion with interested service medical personnel indicated that by no stretch of the imagination would front line conditions permit the use of cyclopropane, so our first clinical search for a safe anesthetic in shock excluded this excellent agent, simply on the basis of impracticability.

The current literature is replete with suggestions of the value of intravenous pentothal for the shocked patient. There has been little published evidence to support these suggestions. Since we were given to believe that battle conditions might require the use of such an agent, our initial clinical observations in a search for a useful, safe anesthetic in shock employed sodium pentothal. The first few patients operated on had suffered a recent perforation of a peptic ulcer. We quickly learned that for such intra-abdominal operations pentothal alone was an unsafe and poorly chosen anesthetic agent, simply because one cannot secure any reasonable relaxation of the abdominal musculature without the use of very unsafe concentrations of the drug. We were unable to examine peritoneal contents satisfactorily or close an abdomen satisfactorily if pentothal alone was used.

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Dr. I. A. Bigger, chief of surgical service, Medical College of Virginia, gave wholehearted support to this clinical study. Dr. M. J. Hoover assisted in the plasma volume studies.

This study was conducted under a contract, recommended by the Committee on Medical Research, between the Office of Scientific Research and Development and the Medical College of Virginia. It was initiated by a grant from the Committee on Scientific Research of the American Medical Association.

1. Evans, E. I., and Beecher, H. K.: The Relation of Anesthesia to Shock, unpublished data.

2. Evans, E. I.: *Ann. Surg.* 117:28, 1943.

3. Beecher, H. K.: Choice of Anesthesia for Seriously Wounded Patients, *J. A. M. A.* 121:899 (March 20) 1943.

Previously, in poor risk cases not in shock I had used bilateral intercostal nerve block as outlined by Bartlett⁴ for anesthesia in abdominal explorations. This method possessed distinct advantages for poor risk cases, its only drawback being that if the surgeon was forced to manipulate the bowel very much the patient complained; unless a nitrous oxide analgesia was employed as an adjunct, it was usually impossible to proceed with the operation.

For shock cases in which much intra-abdominal manipulation must be done, bilateral intercostal nerve block must be combined with some other anesthetic method to insure success. This other method may be nitrous oxide anesthesia; I believe its use is ill advised in shock because of the relative anoxic state usually produced; also the equipment for its administration may not be readily available. The other method may be splanchnic block with procaine hydrochloride. The chief disadvantage to splanchnic block in military surgery is the precise training required so that the results will be adequate; then, most surgeons seem to require an unconscious patient.

In sodium pentothal we possess an agent that is useful in blocking the perception of pain produced by the pull on the mesenteric root. Observations on its effect in shocked patients undergoing abdominal surgery when used in conjunction with bilateral intercostal nerve block would give us information on the value of sodium pentothal in shock patients undergoing surgery of the extremities, when it might be used as the sole anesthetic agent, since relaxation would not be required.

In this report, therefore, I am presenting clinical evidence on the value of a combined anesthetic method for use in shock: the intercostal nerve block is used to insure relaxation of abdominal musculature for adequate exposure and proper closure; the pentothal is used to obviate splanchnic block or an inhalation anesthetic agent to produce unconsciousness. Every effort has been made to approach the problem from the practical point of view forced on the military surgeon, i. e. simple apparatus, oxygen was usually not given, selection of cases similar to those seen in a military campaign, no attempt to restore circulating blood volume by the pre-operative administration of blood or plasma.

CLINICAL OBSERVATIONS

This report is based on the use of this combined anesthetic method on 45 patients in clinical shock on whom abdominal exploration was undertaken because of perforating stab or gunshot wounds of the abdomen or ruptured viscus from external trauma. To these are added observations on the use of sodium pentothal alone in 23 cases of skeletal injury (compound fractures of femur or tibia).

It is emphasized that these observations are enhanced by a knowledge of the actual plasma volume level in all these patients before the anesthetic was given. I am able to state that these shock patients represent a group who have suffered, in the main, a serious reduction of circulating blood volume. We have been conducting, therefore, a clinical study of the effect of sodium pentothal on patients in shock because of a reduced blood volume.

For purposes of illustration of the results to be obtained in clinical shock where sodium pentothal anesthesia may be used, 6 cases are briefly discussed; clinical

findings, a condensed operative report and the anesthetic chart will be given for each case. The results obtained in the illustrated cases represent fairly, I believe, those obtained in the entire series.

THE METHOD OF INTERCOSTAL NERVE BLOCK

As far as I can find, this method was first described by Bartlett⁴ in 1940. Considerable detail is given here as to the anatomy and technic of intercostal nerve block, because if attention is not paid to certain important matters poor results usually follow.

Anatomy (from Bartlett).—The intercostal nerves pass forward in the intercostal spaces below the intercostal vessels. At the back of the chest they lie between the pleura and posterior intercostal membranes but soon pierce the latter and run between the two intercostal muscles as far as the middle of the rib. They then enter the substance of the internal intercostals and run amid their fibers as far as the costal cartilages. The 7th, 8th, 9th, 10th and 11th intercostal nerves then pass behind the costal cartilages and between the internal oblique and transversus abdominis to reach the sheath of the rectus abdominis, which they perforate. They supply the rectus abdominis and end as the anterior cutaneous branches of the abdomen; they supply the intercostal and abdominal muscles. About the middle of their course they give off lateral cutaneous branches. These pierce the external intercostal and the external abdominal oblique muscles and divide into anterior and posterior branches, which distribute to the skin of the abdomen and back; the anterior branches supply the digitations of the external abdominal oblique and extend forward and downward nearly as far as the margin of the rectus abdominis; the posterior branches pass backward to supply the skin over the latissimus dorsi.

Technic of Anesthesia.—It is hard to lay down hard and fast rules for the estimation of proper premedication for a patient in shock. In general we have not been impressed that the premedication dosage of morphine or barbiturates should be lowered appreciably for a patient in shock. The average shock patient is given morphine $\frac{1}{4}$ or $\frac{1}{2}$ grain (0.010 to 0.016 Gm.), phenobarbital sodium 3 grains (0.2 Gm.) as a basal anesthetic and importantly to aid in prevention of the toxic effect of the procaine, and atropine $\frac{1}{100}$ grain (0.00065 Gm.). This medication is given about thirty to forty minutes before the operation is scheduled to start.

After the patient is carefully placed on the operating table, both arms are abducted and placed on arm boards. The skin is prepared with mercresin (a surgical germicide) on either side from above the nipple line to the pubis and to beyond each midaxillary line.

We have employed 1 per cent procaine hydrochloride solution containing 2 minims of epinephrine to the ounce. This has given us sufficient duration of anesthesia for operations lasting up to one and one-half to two hours. If longer surgical procedures are contemplated, 2 per cent procaine solution could be used.

The 7th, 8th, 9th, 10th and 11th nerves are blocked in the midaxillary line starting from the uppermost one and working downward (fig. 1). It is very important that the injections be made in the midaxillary line, because the intercostal nerves lie at the lower border of the rib and between the two intercostal muscles at this point. Also it is at this point where the nerve is most easily accessible and where the lateral cutaneous

4. Bartlett, R. W.: Surg., Gynec. & Obst. 71: 194, 1940.

branch of the nerve supplying most of the external abdominal oblique muscle will be included in the block.

The series of wheals of procaine are placed in the skin immediately below the inferior margin of the selected ribs with a 26 gage needle on a 1 cc. syringe.

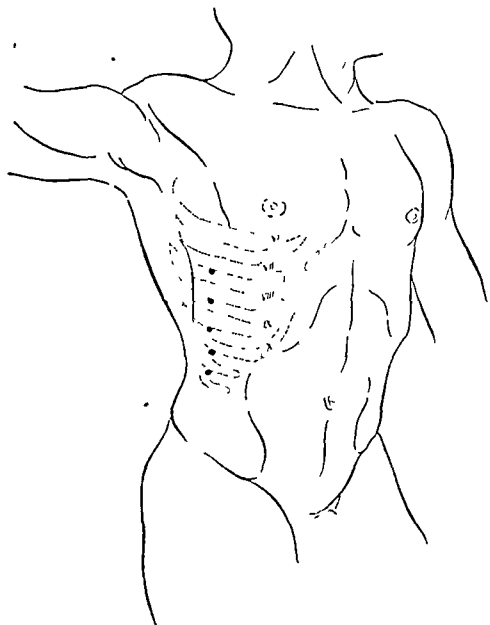


Fig. 1.—Diagram illustrating the points of injection for intercostal block anesthesia. A series of skin wheals are made with 1 per cent procaine-epinephrine solution immediately beneath each designated rib in the midaxillary line. The neurovascular compartment is reached with the needle tip (fig. 2) by pushing the needle just under the rib edge. Five cc. of procaine solution is introduced into each neurovascular compartment.

Then with a 10 cc. syringe and a 19 or 20 gage $1\frac{1}{2}$ inch needle the intercostal nerves are anesthetized by pushing the needle through skin, fat and fascia of the external intercostal muscle. The needle is allowed to slip slowly under the inferior margin of each rib (fig. 2). The nerve and vessels lie in a small compartment between the two intercostal muscles just adjacent to the inferior margin of each rib. Care is then taken to insure that the needle point is not in the pleural cavity or in a blood vessel by careful attempts to withdraw the plunger. When this is ascertained, 5 cc. of 1 per cent procaine-epinephrine solution is injected slowly into each space selected.

The surgeon and his first assistant should each do a side simultaneously; about five minutes is required for the procedure. The anesthetist then starts an intravenous infusion of saline solution into an arm vein, using a setup which will allow for the intermittent injection of pentothal (2.5 per cent). Ten minutes is allowed for the nerve block to become effective, during which time the operating team can scrub.

The skin is prepared again, and sterile drapes and towels are applied. We have usually anesthetized the line of incision in the skin with 1 per cent procaine-epinephrine solution. Subcostal, paramedian, rectus and transverse incisions have been used with the procedure outlined. At the time the skin incision zone is being anesthetized locally the anesthetist starts the pentothal anesthesia. The surgeon does not make his incision until the anesthetist is well under way with this procedure because in the shock state, to prevent fatality, pentothal must be given slowly and wisely. The patient is usually asked to count aloud during pentothal induction. The rate and depth of respiration

must be watched closely and are the best signs for following the course of the shocked patient under pentothal anesthesia. Once pentothal anesthesia is well induced, the surgeon may start the operation.

If the intercostal nerve block has been done properly the patient will be excellently relaxed. More pentothal is given as needed. It has been found important that a steady, uniform level of anesthesia be maintained, because if the patient wakes and strains during the surgical procedure the surgeon may have some difficulty in handling intestines and proceeding with the operation. Further, when the pentothal anesthesia becomes too light the blood pressure in the shock patient tends to fall rather than rise. The pentothal is continued throughout the whole surgical procedure until the surgeon has closed the peritoneum and posterior rectus sheath.

Oxygen may be given by face mask during the pentothal anesthesia and, if available, possibly tends to prevent the further development of shock. In most cases we have not administered oxygen because we believed observations on the effect of this combined anesthetic method without oxygen therapy would more closely parallel battle conditions.

If it is found that the patient seems to be requiring a large amount of pentothal, we have given intravenously morphine $\frac{1}{6}$ grain and have found that this cuts down greatly on the amount of pentothal needed to maintain an adequate anesthetic level.

As to the amount of 2.5 per cent pentothal solution required for induction in the shock patient, in general the amount required seems to be about 50 per cent of

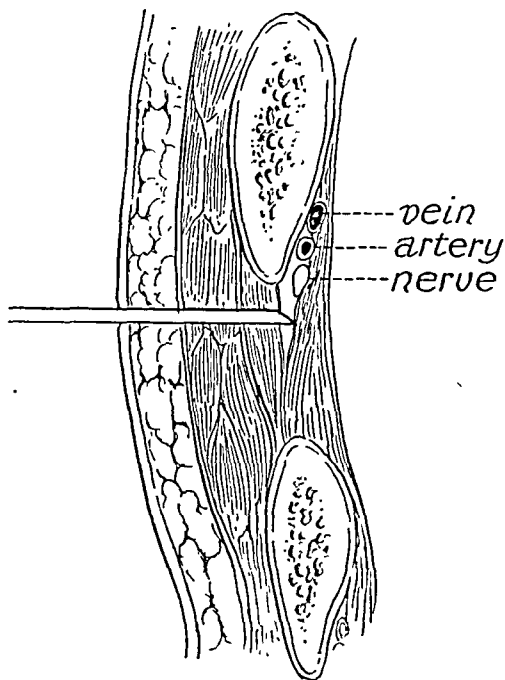


Fig. 2.—Position of needle tip.

that needed for induction in a patient with normal plasma volume. Often only 4 to 5 cc. will carry a patient to a level of adequate anesthesia. Then, too, several shock patients have needed very little pentothal for the entire procedure. The lesson here probably is that pentothal is a very potent anesthetic drug and must be used sparingly and cautiously in the shocked patient.

CLINICAL REPORTS

CASE 1.—J. M., a Negro aged 43.

Diagnosis: *Stab wound of abdomen, severance of 11th right intercostal artery; secondary shock.*

Operation: *Exploration of abdomen; repairing laceration of peritoneum; ligation of 11th intercostal artery, right; complete examination of abdominal organs.*

The patient had been stabbed in the right upper abdomen in the midaxillary line with a butcher knife. On admission there was cold perspiration on his forehead and hands, blood pressure 105/70, pulse rate 96, excellent venous filling time. Examination of the abdomen showed spasm throughout; examination of the abdominal wound with the gloved finger revealed that the butcher knife had entered the 11th intercostal space and cut the 11th rib in two. No preoperative treatment was administered. Blood pressure and pulse remained the same. However, when the patient was taken to the operating room the pressure dropped to 80/60 and the pulse rose to 100 with good volume.

Bilateral intercostal block was done and the patient operated on under intravenous pentothal anesthesia. A right transverse incision was used; 850 cc. of blood was aspirated from the peritoneal cavity and approximately 500 cc. of blood clot also removed. The laceration of the peritoneum was repaired with ligation of the 11th intercostal artery. Complete examination of all the small bowel, ascending colon and hepatic flexure was done. No lacerations of the bowel were found.

During the operation the patient received no blood. Plasma volume at the time of operation by the Gregersen method

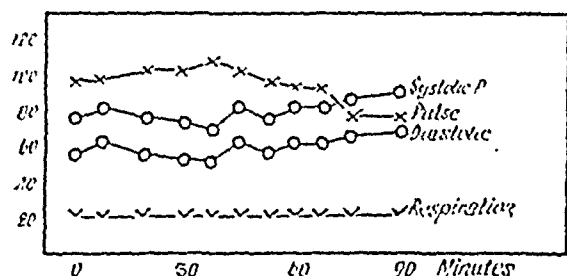


Fig. 3 (case 1).—Anesthesia chart (intercostal block-pentothal) in stab wound of abdomen, secondary shock.

was 30.3 cc. per kilogram.⁵ Figure 3 illustrates the patient's anesthetic record. Relaxation was excellent, examination of bowel and closure of abdomen easy.

CASE 2.—M. J., a Negro woman aged 50.

Diagnosis: *Fractured pelvis; perforation of bladder, with peritoneal extravasation of urine.*

Operation: *Exploratory laparotomy; suprapubic cystotomy.*

The patient was brought to the hospital after being injured in an automobile accident. Examination showed her to have moderate tenderness over the pelvis. The blood pressure was 80/40, the pulse rate 120. X-ray examination showed severe fracture of the pelvis. The bladder was catheterized, bloody urine being obtained, but the resident noted that the return from the bladder was exactly the amount introduced, so he inferred that there was no perforation of the bladder. The patient was watched closely for sixteen hours, when she developed moderate tenderness over the lower portion of the abdomen. A cystogram was made, which demonstrated a small leak in the bladder.

Operation was carried out about twenty hours after the injury. Bilateral intercostal block was done, with added anesthetization of the 12th nerve bilaterally. The blood pressure at the start of the operation was 100/70, the pulse rate 135, with very poor volume. Exploratory laparotomy showed a considerable amount of urine-like fluid in the peritoneal cavity, but no perforation could be found. The peritoneum was closed and the bladder examined directly. No free perforation was found. Suprapubic cystotomy was done, and the patient did quite well for eighteen hours, the pressure then falling to

5. We have accepted 45 cc. per kilogram as the normal figure for plasma volume for adults (Gregersen and our unpublished data).

85/50. Signs of severe secondary shock appeared and she died. Postmortem examination showed a small perforation of the bladder and a perforation of the stomach into the lesser peritoneal sac. She was operated on under bilateral nerve block and intravenous pentothal (fig. 4). It will be seen that a very good response was obtained with this type of anes-

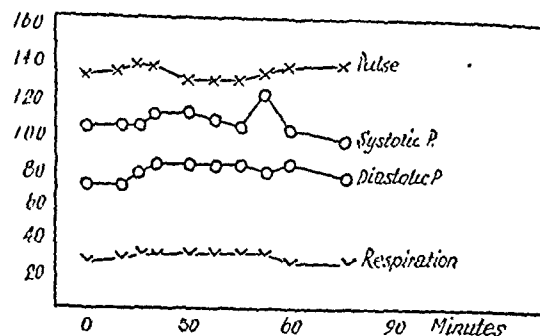


Fig. 4 (case 2).—Anesthesia chart (intestinal block-pentothal) in exploratory laparotomy in ruptured bladder, secondary shock.

thesia in this very bad risk patient, who at the time was suffering from secondary shock due to trauma and early peritonitis.

CASE 3.—A. M., a Negro aged 24.

Diagnosis: *Traumatic rupture of jejunum at the ligament of Treitz; severance of right gastric artery; traumatic laceration right lobe of liver; generalized peritonitis; secondary shock.*

Operation: *Exploratory laparotomy; repair of jejunum; ligation of right gastric artery.*

The patient entered the hospital twenty-eight hours after an automobile accident in which he was struck with an overhanging piece of lumber from a truck ahead of his car. On admission the pulse rate was 120, of very poor volume, the blood pressure 75/50. There was generalized abdominal rigidity and tenderness. The extremities were not cold, nor was there sweating. With no preoperative transfusion or fluids the patient was operated on under bilateral intercostal block with intravenous pentothal anesthesia. An initial dose of 2 cc. of 2.5 per cent pentothal gave complete narcosis. A total of 0.5 Gm. was used for the entire procedure. A right paramedian upper abdominal incision was made; 220 cc. of blood stained fluid was aspirated from the abdomen, the hemoglobin content of which was 23 per cent. A complete transverse tear of the jejunum at the ligament of Treitz and a severed right gastric artery were found. The jejunal rent was repaired and the artery ligated. There was a 4 inch laceration of the right lobe of the liver, which was repaired. Relaxation was excellent and the abdomen closed without any difficulty. Following the operation the patient was given two blood transfusions and did fairly well until his third postoperative day,

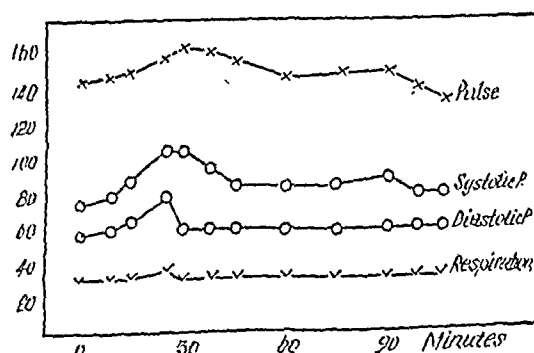


Fig. 5 (case 3).—Anesthesia chart (intercostal block-pentothal) in traumatic rupture of jejunum, severe shock.

after which he declined rapidly and died. Postmortem examination confirmed the operative findings.

A plasma volume determination by the Gregersen method at the time of operation revealed that the patient's plasma volume was 20.2 cc. of plasma per kilogram, so it is apparent that the man was in severe shock at the time of operation. Figure 5 illustrates the anesthetic record of the patient.

CASE 4.—R. J., a Negro aged 39.

Diagnosis: *Stab wound of abdomen; stab wound of liver; hemorrhagic shock.*

Operation: *Exploratory laparotomy with suture of stab wound of liver.*

The patient was admitted to the hospital after having been stabbed in the left upper quadrant of the abdomen half an hour before admission. He had bled profusely; his clothes were covered with blood. Blood pressure on admission was 70/50, pulse rate 100, of extremely poor volume; the extremities were cold and dry; the temperature was 95.8 F. Examination revealed nothing noteworthy except a 1 cm. long stab wound just below the xiphoid process. It was inferred that the man had suffered a severe laceration of the liver with considerable blood loss. He was given 1,500 cc. of 5 per cent dextrose solution but in two hours his pressure had fallen to 50/35, where it remained two hours later. He was then given 500 cc. of blood, but this had very little effect on his general state. We were unable to improve his condition, so it was inferred that he was bleeding from either the liver or a large vessel in the abdomen. Operation was performed about twelve hours after admission. The plasma volume was 25 cc. per kilogram at the time of operation.

Bilateral intercostal block with intravenous pentothal was the anesthetic used. A right upper paramedian incision was employed. On entry into the abdomen 1,200 cc. of blood was aspirated from the abdominal cavity. There was a deep 4 inch laceration in the left lobe of the liver, which was closed

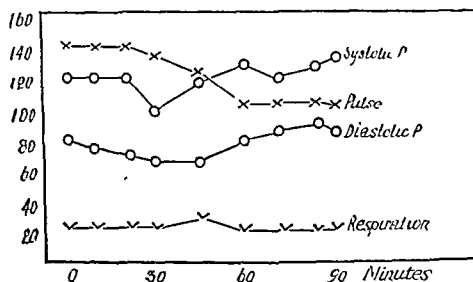


Fig. 6 (case 4).—Anesthesia chart (intercostal block-pentothal) in stab wound of abdomen, hemorrhagic shock.

only by plugging it with a large piece of omentum held in place by several fixation mattress sutures.

This anesthesia worked excellently with the patient and allowed for complete examination of the abdominal contents. The closure was exceedingly easy. Figure 6 illustrates the patient's anesthetic chart.

CASE 5.—J. T., a Negro aged 43.

Diagnosis: *Gunshot wound of left upper quadrant of abdomen; large perforation of splenic flexure of colon; secondary shock.*

Operation: *Exploratory laparotomy; closure of intestinal perforation; examination of abdominal organs.*

The patient was brought to the hospital about half an hour after having been shot with a 0.32 caliber bullet at close range. The bullet had entered the left upper quadrant of the abdomen at the anterior axillary line just below the 10th rib. There were no classic signs of shock, but there was an easily demonstrated slowing of the venous flow in both arms. The blood pressure was 140/100, the pulse rate 88, of fair volume. The plasma volume determined immediately before the operation showed him to have only 27 cc. of plasma per kilogram, with a hematocrit of 49. Other than the spastic abdomen the only findings of interest were that the x-ray plates showed the bullet to have lodged behind the first sacral vertebra within the spinal cord. Neurologic examination revealed the loss of motor power in the left leg.

Abdominal exploration was performed under bilateral intercostal block with intravenous pentothal. A left subcostal incision was used. On entry into the abdomen a large quantity of free blood was encountered. There was a 3½ inch hole in

the splenic flexure of the colon, which was repaired by ordinary methods. No other perforation of the bowel was found after thorough examination. Closure was very easy. Figure 7 illustrates the anesthetic record of the patient, and it may be seen that the response to the type of anesthesia used was excellent. The patient had a very stormy postoperative course.

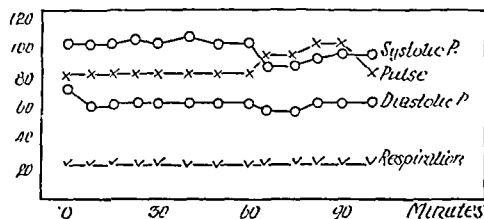


Fig. 7 (case 5).—Anesthesia chart (intercostal block-pentothal) in gun-shot wound of abdomen, secondary shock.

Case 6 is included in this report because it illustrates the results that have been obtained uniformly with intravenous pentothal anesthesia in surgery of the extremities.

CASE 6.—The left leg of a Negro aged 26 had been run over by a freight train about one hour before admission, at which time the patient was very restless, the blood pressure 130/50 and the pulse rate 100, of good volume. There was good venous filling of the arm veins. The only clinical sign of shock presented on admission was the presence of profuse cold sweat on the forehead and extremities. The blood pressure on arrival in the operating room was found to be 70/50 and the pulse had become rapid and thready (rate 140).

Amputation of the left lower extremity above the knee was carried out under intravenous pentothal anesthesia. The blood pressure was unchanged during the main part of the procedure and actually rose toward the end. During the entire procedure the patient received about 600 cc. of isotonic solution of sodium chloride with the intravenous pentothal. The amputation was very easy to do under this anesthesia. Figure 8 illustrates the patient's record.

After the operation 500 cc. of blood was given. A plasma volume determination immediately prior to the operation showed that the patient had a plasma volume of only 28.9 cc. per kilogram, so it is evident that he was suffering from severe traumatic shock due to external loss of blood. Even in the presence of this severe shock, intravenous pentothal anesthesia seems to have worked very well.

COMMENT

In the foregoing pages evidence has been presented that intercostal nerve block combined with intravenous pentothal seems to be a safe and satisfactory anesthetic

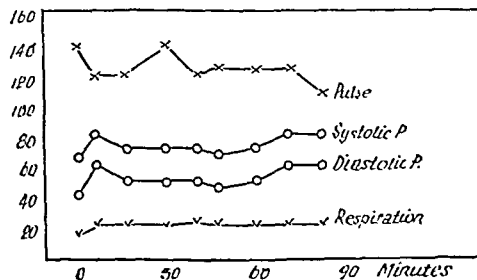


Fig. 8 (case 6).—Anesthesia chart (intravenous-pentothal); amputation of lower limb, severe shock.

for abdominal operations on patients in shock. The cases mentioned in this report were more or less comparable (as regards severity of shock, operative risk and extent of operation) to the whole group so far studied and doubtless represent as serious a type of operative risk as will be encountered in most military practice. To my mind the results gained so far speak for them-

selves. In no case in which death finally transpired was it felt that the anesthetic bore even the remotest relation to the cause of death. There have been no deaths on the operating table.

In our hands this type of anesthesia possesses most of the virtues of spinal anesthesia; complete relaxation is usually secured, the closure is rapid and there is opportunity for excellent approximation of the posterior rectus sheath and the peritoneum. I feel from my experience and from that of others that spinal anesthesia carries with it a tremendous risk to shock patients, which risk seems not to be present with the anesthetic method outlined in this report.

It is believed that it would be a very practical matter for the armed services to teach this method of anesthesia to operating teams who are to carry on the burden of front line surgery. The technic of injection is so simple that it could be taught within a few minutes to any one at all acquainted with the anatomy involved. Failure to obtain relaxation should be rare after even the first attempts. The time and equipment required for the administration of this anesthesia is essentially no more than that involved in giving a spinal anesthetic. In active front line surgery one member of the team could be preparing the next patient by intercostal nerve block as the operating team is finishing an operation.

In this report mention has not been made of the use of this anesthetic method in cases other than acute abdominal emergencies, but it may be of interest to note that this method of anesthesia has been used with success in a growing list of poor operative risks, including perforated peptic ulcers, explorations of the common duct, cholecystostomy, cholecystogastrostomy, biopsies of the liver and strangulation of the small bowel.

One of the chief disadvantages of sodium pentothal anesthesia for the shocked patient may be the slowness of recovery when it is used for a long operation. Occasionally I have noted in shocked patients in whom the combined intercostal block-intravenous pentothal anesthesia method was used that full recovery was delayed for ten to twelve hours. On full recovery they did not seem to have suffered from the lengthy anesthetic period, but in military practice, when rapid evacuation of operated patients is necessary, this slowness of recovery may prove a severe handicap in the handling of patients. Recovery has not been speeded up by the use of metrazol or picrotoxin.

Sodium pentothal with local procaine block has been employed for open chest surgery on several patients with apparently no deleterious effects, but I am strongly inclined not to use routinely sodium pentothal anesthesia for open chest surgery.

In this report no attempt has been made to state the relative safety of pentothal, cyclopropane or ether as anesthetic agents for shocked patients. In the laboratory I have been strongly impressed with the performance of shocked animals under cyclopropane and believe that if it is available it should be used for shock patients. The relative poor performance of shocked animals under ether anesthesia has not blinded me to the fact that for clinical use ether still remains the safest anesthetic agent in relatively unskilled hands. Until clinical studies now in progress on the effect of ether anesthesia in shock have been completed, I would prefer to reserve judgment as to the relative safety of ether versus pentothal when used in clinical shock. I would be emphatic in declaring that I believe these studies with pentothal and ether constitute a real test of anesthetic agents in shock because, even though

serious wounds are present, anesthesia and operation have been deferred only long enough to permit us to estimate by dye methods the blood volume of each and every patient in the study.

In closing, I would be remiss in not sounding a warning as to the dangers of sodium pentothal anesthesia for surgery in shocked patients. Sodium pentothal is an extremely potent anesthetic agent; in the presence of shock only small doses may be required to anesthetize the patient fully. Its use should be delegated to qualified persons, not amateurs. It must not be used alone for abdominal surgery. During the induction period it must be given slowly and sparingly; the surgeon must not be allowed to "hurry" the anesthetist.

Even in the face of these warnings, my belief is that bilateral intercostal nerve block-intravenous sodium pentothal anesthesia will prove to be a valuable and safe anesthetic method for use in the shocked patient who must undergo abdominal surgery. For shocked persons requiring surgery to the extremities, sodium pentothal has proved to be an excellent and safe anesthetic agent.

SUMMARY

Bilateral intercostal nerve block of the 7th through the 11th intercostal nerves in the midaxillary line combined with intravenous sodium pentothal constitutes an apparently safe and satisfactory anesthesia for abdominal operations on patients in moderate or severe shock (45 patients). Intravenous sodium pentothal alone has been used with success also in 23 shock patients who have suffered severe trauma to the extremities where major surgery had to be done.

FAILURE OF THE SWEAT MECHANISM IN THE DESERT

THERMOGENIC ANHIDROSIS

CAPTAIN JULIUS WOLKIN

CAPTAIN JOSEPH I. GOODMAN

AND

CAPTAIN WILLIAM E. KELLEY

MEDICAL CORPS, ARMY OF THE UNITED STATES

Present day concepts of the effect of extreme heat on the human body have been associated with the terms heat stroke, heat exhaustion and heat cramps. We have had the opportunity to study a syndrome involving failure of the normal sweat mechanism in a group of soldiers affected variously by extreme heat. We believe this syndrome must be differentiated from heat stroke and heat exhaustion. As represented in textbooks the latter are generally described as follows: Heat stroke is characterized by collapse, delirium, irritability and visual disturbances. Nausea and vomiting may forewarn one of the impending attack. Often it occurs with dramatic suddenness. Significant physical findings in addition to the altered mental state include hot dry skin, elevation of body temperature (106-110 F.) rectally, rapidity of the pulse, with a rate of 160 to 180 per minute, and increased depth of respiration, which may simulate Kussmaul breathing.

Heat exhaustion is manifested by headache, loss of appetite, drowsiness, extreme weakness, visual disturbances, vomiting, vertigo and inability to walk. There may also be cramps of varying severity of the limb and abdominal muscles. Examination of the affected person reveals that the skin is cold and clammy

and wet with profuse perspiration. The mouth temperature is usually normal; the rectal temperature may be normal, subnormal or slightly elevated. The pupils are dilated, the pulse rate is increased and the blood pressure may be lowered.

Heat cramps are sufficiently clear not to complicate a differential diagnosis of heat disturbances. They are manifested by painful contracture of the voluntary muscles, more frequently of the extremities and abdominal wall.



Fig. 1.—Thermoregulatory (heat) sweating test. Note anhidrosis below level of neck and the compensatory hyperhidrosis above.

This report is based on a study of eight soldiers actively engaged in normal military training in the American desert area. Temperatures encountered here exert a profound effect on the body heat economy. As will be shown herein, this group of soldiers exposed to desert heat exhibited primarily a derangement of their sweating, producing a picture significantly different from presently accepted entities. The importance of sweating as a factor in regulation of the heat economy has clearly been brought out in the work of Hyndman and Wolkin.¹

We observed that the cases studied did not conform clinically with either heat stroke or heat exhaustion. In general they all presented a typical history, viz. a rather sudden onset of generalized weakness, subjective warmth and discomfort, dizziness, "all-in" feeling, headache and shakiness. These symptoms occurred during exposure to sunlight, either with or without physical exertion.

The onset of these symptoms was associated with or preceded by a cessation of sweating in each case. This was in turn often preceded by a distinct period of profuse outpouring of sweat from a few days up to several weeks in duration. The loss of sweating was limited uniformly to the body region below the neck in pronounced contrast to the outpouring of sweat from the face and neck.

The objective findings were characterized most of all by a warm, dry skin from the neck down, whereas the face and neck showed profuse droplets of sweat. The skin of the entire body below the level of the neck had the appearance of goose flesh. However, this fine papular eruption did not appear and disappear in a matter of minutes like goose flesh. The papular eruption was diffuse and uniform, each papule being about the size of a large pinhead. In cases of longer standing there was a fine, branny desquamation. As the condition improved, the fine papular eruption disappeared and the skin resumed its normal appearance. In some

cases the condition was recognized solely on the appearance of the skin.

The body temperature for the most part remained below 99 F. orally except on those occasions when the external environmental temperature reached heights of 120 F. or over. Under these conditions complaints of extreme feeling of heat, discomfort and irritability were offered.

In general, all of these cases promptly improved subjectively by the simple expedients of cool environment and rest.

In order to portray more clearly the disturbances of the sweat mechanism which were observed clinically, the starch-iodine method of Minor² was used. The iodine solution was applied to the skin and allowed to dry. Corn starch was then dusted on the body.

The normal sweat pattern in man in response to heat stimuli and cholinergic drugs has been previously described by List and Peet³ and by Hyndman and Wolkin.⁴ Similarly we have studied the sweating response to heat, pilocarpine and mecholyl chloride in these cases.

In normal persons sweating is initiated physiologically whenever the external temperature reaches a point at which the need for body heat dissipation exists. This is known as thermoregulatory sweating. In carrying out thermoregulatory or heat sweating tests on our patients, the nude body was subjected to the desert sun at temperatures exceeding 120 F. until the degree of sweating appeared to have reached a maximum. Hot tea and acetylsalicylic acid 10 grains (0.65 Gm.) before exposure were used to augment the sweat response.

Each of our 8 patients invariably showed pronounced hyperhidrosis of the face and neck. Below the neck the sweating response in all cases was almost entirely absent (fig. 1). In a few, isolated islands of sweat appeared over the abdomen and legs.

To produce cholinergic sweat response, we injected pilocarpine $\frac{1}{4}$ grain (0.016 Gm.) hypodermically. Later, mecholyl 25 mg. hypodermically was substituted.

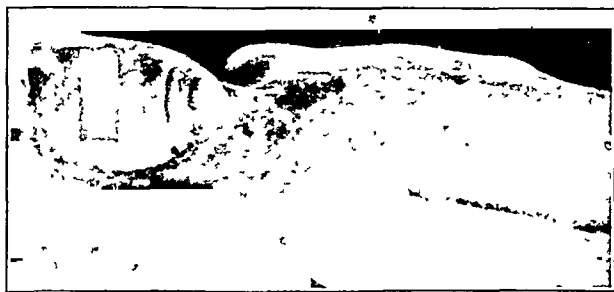


Fig. 2.—Pilocarpine sweating test. Note distribution of sweat as in figure 1.

The response to cholinergic drugs (pilocarpine and mecholyl) paralleled in every case the response to heat (fig. 2), viz. almost complete anhidrosis below the

2 Minor, V. Ein neues Verfahren zu der klinischen Untersuchung der Schweissabsonderung, *Deutsche Ztschr. f. Nervenh.* 101: 302-308, 1927.

3 List, C. F., and Peet, M. M.: Sweat Secretion in Man: I. Sweat Responses in Normal Persons, *Arch. Neurol. & Psychiat.* 30: 1225-1237 (June) 1938.

4 Hyndman, O. R., and Wolkin, Julius: Sweat Mechanism in Man. Study of Distribution of Sweat Fibers from Sympathetic Ganglia, Spinal Roots, Spinal Cord and Common Carotid Artery, *Arch. Neurol. & Psychiat.* 45: 446-467 (March) 1941; Pilocarpine Sweating Test. I. A Valid Indicator in Differentiation of Preganglionic and Postganglionic Sympathetomy, *ibid.* 45: 992-1006 (June) 1941.

1 Hyndman, O. R., and Wolkin, Julius: The Autonomic Mechanism of Heat Conservation and Dissipation: I. Effects of Heating the Body; Evidence for the Existence of Capillary Dilator Nerves in Anterior Roots, *Am. Heart J.* 22: 289-304, 1941.

neck and hyperhidrosis above. For our purpose it is sufficient to emphasize that in a normal person this amount of mecholyl will induce profuse sweating over the entire body (fig. 5).

These patients were again subjected to the tests when it appeared clinically that normal sweat function had

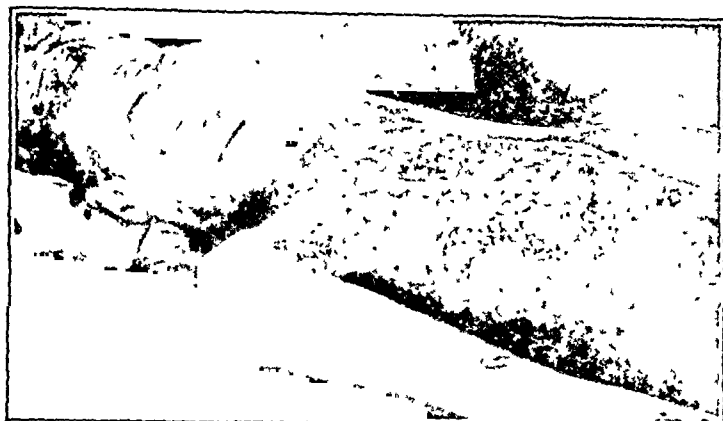


Fig. 3.—Thermoregulatory (heat) sweating test. After recovery of sweat function.

returned. All the cases showed the normal sweat pattern in response to both heat and mecholyl (figs. 3 and 4).

REPORT OF CASES

CASE 1.—W. B., aged 30, was admitted to the 97th Evacuation Hospital on Aug. 12, 1943 after ten months' service in the Army. Six days previously, while scrubbing pans in the sunlight, he became shaky and weak and developed a headache. He stated that his skin was dry below the neckline. This was associated with an inability to sweat over the torso and extremities. Rest in bed was followed by prompt relief of all the subjective symptoms. After three days in bed at his battalion aid station and another three days in his own tent he returned to duty, but the symptoms promptly reappeared. On admission he appeared well. Most prominent was the appearance of the skin below the neckline. It was dry and scaly with a mottled appearance from tiny white prominences, reminding one of goose pimples. During his hospital stay he felt very well at night and in the morning. In the afternoon as the external temperature of the tent increased (as high as 120 F.) he became very hot and uncomfortable. His oral temperature on some occasions would rise to 100 or 101 F. Although there was no perceptible sweating in the remainder of the body, the head and neck perspired more profusely than normal. When his body was

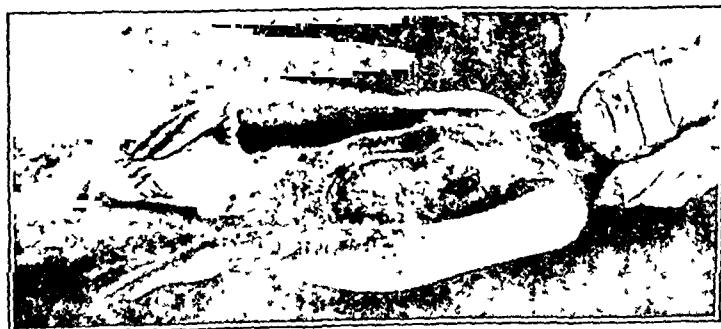


Fig. 4.—Pilocarpine sweating test. After recovery of sweat function.

cooled by wet sheets or by removal to an air conditioned van, there ensued a prompt reduction of temperature and disappearance of his headache.

CASE 2.—This soldier came from Louisiana to the desert on June 15, 1943. He felt very well in Louisiana, as well as in Mississippi prior to that. Between June 15 and August 8 he was quite well except in the afternoons, when he experienced a feeling of "passing out," i. e. he became faint and complained

of his head "whirling." On August 10 he walked about 2½ miles in bright sunlight. He thought of falling out of the column but remained with his company and rode back to camp in a truck. That evening he had no further complaints. On the morning of August 11 no untoward symptoms developed during lectures, close order drill and calisthenics. After his noon hour meal he again experienced a feeling of "passing out"; hence he slept until 2 o'clock. On awakening, his legs seemed heavy and his head ached. During a mile walk to classes, his underclothes were soaked around the chest and waistline. Classes continued in the shade until 5 o'clock. On the walk back to quarters he felt "all in." He reported to the aid station, where he was treated by ice sheet applications and given ice water to drink. At the clearing station that night he received intravenous fluids and was subsequently admitted to the 97th Evacuation Hospital. On admission he had no definite complaints. After several days in the hospital he noticed that the skin of his arms and legs was dry and scaling. Then he realized that he was not sweating, though his face and neck perspired profusely. He was unaware of the abnormal sweating condition until questioned, when he recalled that the skin of his arms and legs had been dry for some time. He was certain that he sweated normally prior to June 15, 1943. On August 23 his temperature rose from 98.6 F. to 99.4 F. (orally) after one-half hour exposure to the sun. As a result of this exposure he became nervous and "dizzy." Sweating below the neck had not returned up to the time of his evacuation (fourteen hospital days).

CASE 3.—R. A., aged 22, was admitted to the 97th Evacuation Hospital on Sept. 6, 1943 with the following story: On August 26, while on a 2 mile hike, he complained of an "all in"

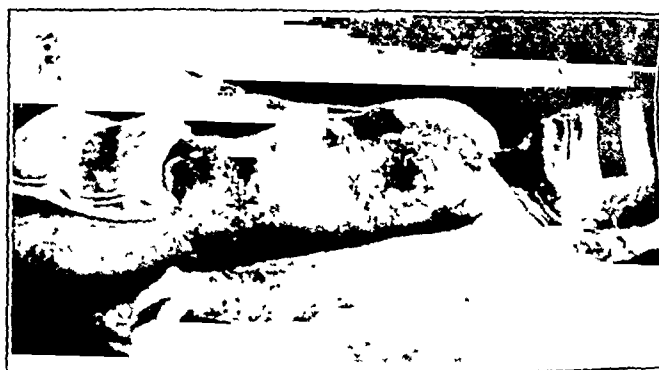


Fig. 5.—Normal sweat response to mecholyl by normal person.

feeling. Previously he had easily negotiated distances of 20 to 25 miles. Despite a two hour rest period he continued to note this "all in" sensation on the return trip. He complained of extreme heat and barely completed the distance. Sweating had ceased except for profuse perspiration of the head and neck. He remained on duty and took four to five salt tablets a day on medical advice. However, his symptoms continued despite the salt. On August 27, during a 1 mile walk, he "burned up all over" and had to be carried back in a jeep. He noticed some improvement after a cool shower. Afterward he had felt well in the morning and very tired in the afternoon even on light duties. He was referred to this hospital twelve days later because of failure of adequate salt intake to improve his symptoms. He had noted extreme hyperhidrosis for a period of weeks preceding the onset of symptoms.

Sweating tests performed on September 6 and September 8 showed decidedly diminished sweating below the neck, but on September 17 and September 18, as shown by similar tests there was almost complete recovery.

CASE 4.—F. N., aged 19, was admitted to the 97th Evacuation Hospital on Sept. 6, 1943, stating that on September 5, while engaged in greasing vehicles (which he had done many times previously), he suddenly became light headed and extremely weak. For two or three days preceding, he had been feeling tired and had complained of being hot all over. He had noted a disappearance of sweating, except on the face and

neck, the morning of September 5. He had always been a profuse sweater prior to this episode. Within three hours after hospitalization his weakness had disappeared with no specific treatment other than rest in the shade.

On September 8 sweating tests showed pronounced hypohidrosis below the neck. Similar sweating tests performed on September 18 showed the recovery of sweating.

CASE 5.—R. L., aged 34, was admitted to the 97th Evacuation Hospital on Sept. 6, 1943. Beginning on August 21, he developed miliaria over his entire body except the face and neck. Within the succeeding three days he noted the disappearance of sweating over the arms, legs and sides of the torso. On August 31, while erecting a tent, he became light headed and lay down on the tent floor. He improved when cold water was poured on him. Afterward, whenever exposed to the sun, he sensed a similar occurrence. Despite the excessive dryness of his skin elsewhere, there was more than normal perspiration of the face and neck.

Heat tests and mecholyl injection on September 8 revealed diminished sweating below the neck. There was complete recovery of sweating function on repetition of the same tests on September 17 and September 18.

CASE 6.—B. R., aged 18, was admitted to the 97th Evacuation Hospital on Sept. 6, 1943 complaining that he became very hot and "dizzy" the day before while on the firing range. That morning he was nauseated and had noted a cessation of sweating. He was admitted with a diagnosis of heat exhaustion. The temperature was 102 F. rectally. He was given ice packs at the clearing station and 2,000 cc. of 5 per cent dextrose in isotonic solution of sodium chloride at this hospital. Within six hours his temperature dropped to normal, where it remained. His sweating function had returned to normal within twenty-four hours.

Six weeks prior to this episode he suffered a similar attack consisting of loss of sweating, nausea, vomiting and dizziness. He recuperated promptly, and the sweating function returned within nine to ten hours. No sweating tests could be done because of prompt recovery.

CASE 7.—I. R., aged 20, admitted to the 97th Evacuation Hospital on Sept. 15, 1943, related the following story: On arrival on the desert, June 18, he engaged in heavy manual work, causing perspiration "to pour off him in buckets." On August 18 he was transferred elsewhere in the desert. At this time he had noted that his sweating gradually had disappeared except around the head and neck, where sweating was profuse. Interestingly enough, his work in the new area was much less strenuous. On September 8 he traveled six hours across the desert in a jeep. On his return he felt light headed. He walked to his tent, where he lost consciousness for a few seconds. Medical aid was given along the lines of treatment advised for heat exhaustion, viz. blankets, elevation of the feet and salt. On September 10 at reveille he sensed a feeling of "pins and needles" all over and weakness in the use of his arms and legs. He was given salt pills in the dispensary but was referred to our hospital on September 14 because the symptoms persisted.

Sweating tests on September 17 revealed diminished sweating below the head and neck.

CASE 8.—V. V., aged 28, who was admitted to the 97th Evacuation Hospital on Sept. 17, 1943, had been on the desert for three months and had never had any previous difficulty in hiking. He described sweating of such a degree as to simulate water "coming out of a hose." On September 16 during a hike he felt as though he were "burning up." Others whose jackets were wringing wet inquired "How does it happen you are not wet like we are?" He was admitted to our hospital after a short episode of unconsciousness. The receiving officer noticed the association of unconsciousness with a dry hot skin and suspected a heat stroke but was surprised to find a rectal temperature of only 99 F. The patient responded quickly to the local application of ice and regained consciousness in fifteen to twenty minutes, at which time he was not conscious of sweating anywhere.

Our sweating tests of September 17 revealed pronounced diminution in sweating, most prominent below the head and neck.

COMMENT

A careful analysis of the case reports discloses certain features which serve to set apart this syndrome from heat stroke and heat exhaustion. We agree that at first glance one might conceivably mistake such cases for heat stroke, especially if seen during transient periods of unconsciousness (see case 8). Furthermore, the dry hot skin universally present in heat stroke and strikingly present below the neck in this group of cases might be a confusing feature. The similarity, however, ends here, for the well known hyperpyrexia, coma, elevated pulse rate and increased respiratory rate of heat stroke are conspicuously absent in our group.

There are perhaps more grounds for possible confusion with heat exhaustion. The headache, generalized extreme weakness and vertigo in our cases are likewise present in heat exhaustion; however, the cold clammy skin and signs of shock, which are integral components of heat exhaustion, are invariably absent in the syndrome under discussion.

Among the admissions to the 97th Evacuation Hospital for the period from July 21 to Sept. 23, 1943 there were 77 patients with some form of heat disorder. Of these there were 3 unquestioned heat strokes, having a characteristic hyperthermia (107 to 110 F.). The remaining 74 patients were admitted for the most part with the diagnosis "Heat, ill defined effects of." Unfortunately many of these cases had been evacuated prior to the recognition of this syndrome. Nevertheless we were able to uncover 8 cases but feel certain that many similar to these described were present in the group as a whole, since we had relatively little difficulty in discerning such cases among our most recent admissions. In retrospect it is noteworthy that relatively few of the 77 cases could satisfactorily be classified as heat exhaustion.

The Role of Salt.—The early work of Haldane on chloride loss through excessive perspiration in laborers subjected to extreme heat has universally been accepted as sufficient explanation for the symptomatology of heat exhaustion.

In this regard it should be pointed out that all of our cases were originally seen and treated in battalion aid, collecting and clearing stations. All were given some form of salt therapy, 4 to 6 grams daily as oral tablets, in addition to using drinking water fortified with salt in a 0.1 per cent solution. Only after failure of the regimen to affect their symptoms were these patients transferred to our hospital. On the other hand we have observed that merely the removal of these patients from excessive heat and relief from duty served to allay the symptoms rapidly. On trial exposure to sunlight during hospitalization their initial symptoms returned. (See case reports.)

After recovery of the sweating function, however, the symptoms could not be provoked even when the patient was again temporarily subjected to excessive heat of the desert sun. This demonstrates that the presence or absence of normal sweating function is the determining factor in the production of this syndrome, while the intake and excretion of salt apparently play an insignificant part.

Further support for this view is lent by the laboratory data gathered on 20 of the 77 patients by Captain Louis

Rosenbaum⁵ at the time of their admission to this hospital. There was no deviation from the normal blood chloride level in any instance of heat stroke or in any of the less well defined cases of heat exposure, which Captain Rosenbaum chose to regard as heat exhaustion for want of a better term. Four of the cases in this paper are included in his data.

We believe, then, that our group should not be regarded as heat exhaustion for the following reasons: 1. The clinical course of the observed syndrome is one of decreased sweating frequently following an initial temporary period of hyperhidrosis. Interestingly enough, the symptoms appear to start with the cessation of sweating. 2. The soldiers develop and retain their symptoms despite doses of salt intake prescribed to prevent just such an occurrence. 3. The small amount of laboratory evidence available indicates no deviation from the normal blood chloride concentration.

Role of the Thermoregulatory Mechanism.—Sweat glands are controlled solely by the thoracolumbar or sympathetic division of the autonomic nervous system. However, many investigators have demonstrated that there are two types of fibers in the sympathetic system, and it is now generally accepted that two types do exist, viz. cholinergic and adrenergic fibers. Sweat gland activity is definitely a cholinergic response.

As far as its thermoregulatory control is concerned, the response of the skin to changes in external temperature is characteristic. Thus, in conserving heat there is vasoconstriction of the skin vessels, absence of sweating and pilomotor activity, whereas in dissipation of heat there is vasodilatation of the skin vessels, sweating and absence of pilomotor activity. Under conditions of extreme heat, such as one encounters in the desert, the normal reaction of the body is integrated toward a purposeful end, namely heat dissipation. One of the important effects of this reaction is the onset of sweating; hence it is readily seen how any alteration of sweating response would profoundly affect the ability of the body to dissipate heat. We have seen described herein the type of clinical picture which results from such a dysfunction.

In attempting to analyze the pathophysiology which may underlie such a failure of the sweat apparatus, two possible sites of involvement are to be considered: (1) central—thermoregulatory center in the hypothalamus; (2) peripheral—the nerve endings or sweat glands. As far as the central site is concerned, the retention of sweating of the face and neck would seem to militate against localization of the disturbance of the thermoregulatory center. It is difficult to postulate a central lesion, functional or organic, acting in such a manner as to spare the face and neck consistently. Again, in the hyperthermia following cerebral operative procedures, in which a lesion of the thermoregulatory center exists the resulting anhidrosis invariably involves the entire body. Similarly in the hyperthermia of heat stroke and thyroid crises we have observed complete anhidrosis. Evidence that the face and neck have a thermoregulatory control center distinct from the rest of the body is lacking.

The possible role of the end organ apparatus and the sweat glands themselves merits some discussion. It appears unlikely that the intrinsic function of the sweat glands can be altered. Previous work of Hyndman and Wolkin⁶ had shown that the sweat glands are

capable of functioning several years after complete sympathetic denervation. This is evidenced by contact sweating.⁷

It would appear from consistent failure of the peripherally acting cholinergic drugs to invoke their normal response in our patients that the end organs are the site of involvement. Yet this explanation cannot be sustained in view of the following fact: Pilocarpine and mecholyl fail to produce a peripheral stimulation of sweating even in the presence of known central damage, viz. postoperative cerebral hyperthermia, heat stroke and thyroid crisis. Such a lack of response to the cholinergic drugs may be viewed as an active central inhibition strong enough to counteract the effect of the drugs.

Returning to the clinical picture, several significant features stand out: 1. The frequent occurrence of a transient period of hyperhidrosis. 2. The sudden subsequent hypohidrosis coincident with the production of the clinical syndrome. 3. The relatively rapid recovery of normal function. This sequence of events raises the question whether the initial hyperhidrosis could be thought of as an overtaxing of the thermoregulatory mechanism to the extent of producing a temporary functional "paralysis."

CONCLUSIONS

The syndrome of failure of the sweat mechanism in the desert which we have described stands out clearly from the hitherto-accepted concepts which identify only heat stroke, heat exhaustion and heat cramps. The early recognition of the syndrome is of paramount importance, since its proper management demands immediate removal from excessive heat. Often there has been a tendency to regard this group as merely forms of heat exhaustion and to return these soldiers to duty with only the admonition to continue oral salt intake. Salt is not indicated and we believe of no value.

We cannot stress too much that these patients require avoidance of exposure to excessive heat until the sweat function has returned to normal. Even after recovery we are inclined to oppose their return to similar climatic conditions.

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7. If two skin surfaces are brought in contact even after complete sympathectomy, sweating will be produced along the contact areas.

Relations of the State to the Scientist.—The lowly and junior profession of medicine, unlike its proud and elder sisters, has had no direct part and no direct influence in the work of government. It has therefore had to submit to its duties being piled up as occasion arose, with no resource for securing a due compensation of privilege and immunity except such slender sense of natural justice as governments possess and their occasional doubts about the prudence of overloading a willing beast. These resources have shown all the ineffectiveness we might have expected. The result is that, at a time when it is no longer possible to conceal the wholly unique importance of medicine for the very existence of social life, that profession finds itself of all professions the least in command of social prestige, the least privileged, the most exposed and the hardest worked. I do not mention this state of affairs because I think it is to be deplored. I do not think it is to be deplored. The evolutionary cause that has put the profession of medicine where it is may not be the one that would have been pursued by conscious wisdom, but it has had the result of putting medicine in the very small class of professions that, in this tame world, can still be called jobs for men.—Trotter, W.: *Collected Papers*, London, 1941.

5. Rosenbaum, Louis: Personal communication to the authors.
6. Footnote 4, first reference.

THE GENERAL OR SUPPORTIVE TREATMENT OF WOUNDED PERSONS

PAUL HOXWORTH, M.D., PH.D.
CINCINNATI*(The papers by Drs. Hoxworth, Siler, McGrath and Ziminger, with the discussion, conclude the symposium begun last week.)*

In the treatment of wounded persons general supportive measures are required to overcome effects of severe hemorrhage and shock, to secure proper water balance and nutrition, to aid in wound healing and to combat infection. The judicious use of water, electrolytes, whole blood, plasma and vitamins is an attempt to restore and maintain optimal physiologic conditions in order to enhance local healing and aid in general recovery. To define supportive treatment except in relation to an individual patient at a specified time is difficult, and definition properly can be made only after repeated careful clinical appraisal and use of laboratory guides as adjuncts at regular intervals. Also limitations may exist in the form and availability of substances to be used in any one clinic. Nevertheless a rational basis for administration of supporting substances should be held clearly in the mind of any physician who treats severely wounded persons.

At the Cincinnati General Hospital the surgical division has always had a large traumatic service. It is my purpose in this article to describe the methods used here in the approach to the problems which arise in the supportive management of wounded persons.

SEVERE HEMORRHAGE

Once it is determined that severe hemorrhage has occurred, immediate replacement of lost blood volume is begun. Absence of signs of shock does not alter procedure, since they may be delayed. If the history or nature of the injury suggest that enough blood may have been lost to cause later manifestations of shock, this is sufficient. The foot of the bed is elevated unless there is a chest injury, morphine is given if the patient is restless or apprehensive, and an intravenous injection of 5 per cent dextrose and isotonic solution of sodium chloride is begun, using nothing smaller than an 18 gage needle. The rate of administration is rapid, with the bottle held at least 3 feet above the site of injection. Meanwhile plasma is obtained from the blood bank and substituted for the saline-dextrose mixture as soon as possible. The time required for this is about ten minutes and usually not more than 500 cc. of saline and dextrose solution has been given. Units of 250 cc. of plasma are added until improvement and stability are noted in blood pressure, pulse, warmth and color. If no signs of shock were present initially and no surgical procedure of considerable magnitude is contemplated, the intravenous infusion is usually discontinued after 500 cc. of saline and dextrose solution and one or two units of plasma have been given. Administration is continued in the event that the patient is moved to the operating room for a procedure such as the amputation of an extremity, débridement of a large wound, laparotomy or thoracotomy. During this time a sample of the patient's

blood has been sent to the laboratory and compatible whole blood is available in about thirty minutes. Blood is then substituted for plasma and given continuously as long as it is indicated.

During the early and emergency management of these cases the quantity of plasma and blood administered and the question of how long they should be continued is determined primarily by clinical signs. In the meantime a small heparinized sample (3 cc.) of blood has been sent to the laboratory for hematocrit and plasma protein determination. If the hematocrit reading or the plasma protein content is low, more whole blood or plasma is given accordingly.

The standards of normal for plasma proteins are taken at 6 to 8 Gm. per hundred cubic centimeters and for the hematocrit 42 to 50 per cent in the male and 39 to 43 per cent in the female. The laboratory method for hematocrit determination is the capillary tube method described by Guest and Siler.¹ The plasma protein determinations are made from the same sample of heparinized blood, after centrifugation, by the falling drop method of Barbour and Hamilton, more recently emphasized by Drew, Scudder and Papps.² If used together and repeated from time to time, these tests are valuable aids in controlling fluid therapy. It is our belief that a well trained technician who is doing many tests must be employed if reliance is to be placed on the results.

SHOCK

In shock secondary to trauma or burns the early supportive management differs in only a few respects from that employed in hemorrhage. Morphine is used more freely because these patients tolerate large doses well. If the injury appears at all likely to be sufficient to result in shock, even though there are no positive signs on admission, intravenous replacement is begun in the manner described for hemorrhage.

In these cases, however, plasma administration is continued without the substitution of whole blood, since the intravenous administration of plasma replaces in kind the substance that is being lost into the tissues. As a result of the cellular content, whole blood is only 50 to 60 per cent as effective per unit volume. In addition, whole blood increases the viscosity of the blood (as plasma continues to be lost the red cells remain) and augments hemoconcentration. Whole blood is very useful if plasma is not available or, after the patient is stabilized, to correct anemia if it is present.

WATER BALANCE

Once the shock mechanism is corrected by plasma transfusion and local treatment to the contributing cause, attention is directed to preserving adequate hydration and securing correct water balance between the tissues and circulatory system. Water requirements must be met and, for proper distribution of the water, physiologic plasma protein and chloride levels maintained. The role of proteins and electrolytes as well as water in water balance is well known; neglect of any of the three factors will disturb the balance and may result in tissue dehydration or edema. Loss

From the Department of Surgery of the University of Cincinnati College of Medicine and the Cincinnati General Hospital.
This paper, in a symposium on "Traumatic Wounds," is published under the auspices of the Section on Surgery, General and Abdominal.

1. Guest, G. M., and Siler, V. E.: A Centrifuge Method for the Determination of the Volume of Cells in Blood, *J. Lab. & Clin. Med.* 19:757 (April) 1934.

2. Drew, C. R., Scudder, John, and Papps, Jean: Controlled Fluid Therapy, *Surg. Gynec. & Obst.* 70:859-867 (May) 1940.

of water, proteins and electrolytes occurs initially in injuries. Further losses of water and electrolytes may result from prolonged anesthesia, diaphoresis, fever, vomiting or continuous gastric expression. Continued loss of proteins occurs in burns, empyema and peritonitis. In addition, the metabolic loss which results during the period in which nothing is taken by mouth must be provided for parenterally. Optimum water balance is a prophylactic measure against delayed wound healing and wound infection. In some cases it may prevent edema of lungs, myocardium and liver, which favors pneumonia and disturbed cardiac or liver function.

Careful clinical observation and selected laboratory aids are the two sources of criteria for determining when and in what volume to administer parenteral water, electrolytes and proteins.

The degree of moisture of the skin and tongue and measured and recorded water intake and urinary output are regarded as the most important indexes of the state of hydration. The charting of fluid intake and urinary output is a routine essential. A urinary output of from 1,000 to 1,500 cc. in the adult each twenty-four hours indicates adequate hydration if normal kidney function may be presumed. Following the use of sulfonamides attention to establishing a good urinary output in the first twenty-four hours postoperatively and thereafter assumes additional importance in avoiding urinary and systemic complications.

In severe burns, peritonitis and empyema there is continued plasma loss into tissues and onto skin or serous surfaces, and protein reserves may become depleted. Under conditions of adequate hydration, depleted protein reserves will be reflected as low plasma protein percentage if tests are made. Hematocrit and plasma protein determinations are made daily or twice daily to learn the degree of hemoconcentration or anemia and protein loss and, when correlated with clinical judgment, serve as excellent guides to the control of fluid therapy. Intravenous solutions of 5 per cent dextrose and isotonic solution of sodium chloride are necessary for caloric and electrolyte requirement and hydration, but continued administration of these solutions if plasma proteins are below 6 Gm. per hundred cubic centimeters are guarded against for two reasons: First, further dilution of plasma proteins by hydration with crystalloid solutions may intensify tissue edema due to hypoproteinemia. Second, tissue edema may be increased by salt retention. In the presence of low or normal plasma proteins and a subnormal hematocrit, whole blood is administered until normal levels are obtained. Plasma is given in the presence of reduced plasma proteins if the hematocrit is normal or elevated.

It would be well to state here some of the limitations which we have encountered in the determination of plasma proteins by the specific gravity method. Samples taken from patients with hyperglycemia and hyperbilirubinemia may give false high results. These conditions are not encountered often in treating wounded persons. In some cases plasma protein levels of 6 to 8 Gm. per hundred cubic centimeters may persist for a short time if a fall in albumin is balanced by a corresponding increase in globulin. This circumstance frequently antecedes the fall in total protein. For this reason occasional quantitative albumin and globulin determinations are of value in the management of protracted cases. Plasma transfusions are indicated in the presence of disturbed

albumin:globulin ratios, since a depletion in albumin reserves is suggested.

Solutions of electrolytes in the form of 5 per cent dextrose in saline solution or dextrose in distilled water are given in sufficient quantity to maintain adequate urinary output and normal plasma chloride levels. High fever, diaphoresis, vomiting, continuous gastric expression and diarrhea are factors which add to the rate of water and electrolyte loss in the later management of injured persons and require increased amounts of crystalloid solutions. In patients who are dehydrated initially and in whom water requirements may exceed 3,000 or 4,000 cc. for the first twenty-four hours, continuous intramuscular infusion of isotonic solution of sodium chloride is used frequently to supplement intravenous injections. A long needle is inserted deep to the tensor fasciae on the lateral aspect of the thigh. The impression is that absorption is more rapid and less painful than by the subcutaneous route. The addition of 10 cc. of 1 per cent procaine solution to each liter of fluid aids in comfort to the patient. Dextrose solution is not given intramuscularly because of painful irritation of tissues.

Normal plasma chloride levels range from 500 to 550 mg. per hundred cubic centimeters. Calculated amounts of sodium chloride given as isotonic solution of sodium chloride of 0.5 Gm. per kilogram of body weight each twenty-four hours will raise the plasma chlorides about 100 mg. This is provided abnormal chloride loss is not occurring as a result of profuse diaphoresis, protracted vomiting or continuous gastric expression. With these considerations in mind the clinician can better avoid the production of either edema of tissues due to the over-administration of sodium chloride or disturbed acid-base balance due to deficiencies. The use of plasma chloride and carbon dioxide combining power determinations are valuable laboratory aids.

NUTRITION

Other important considerations in the treatment of wounded persons are the nutritional requirements. Adequate parenteral feedings of dextrose, proteins and vitamins from day to day aid in general recovery, promote wound healing and combat infection.

Dextrose is given intravenously in the form of a 5 or 10 per cent solution, along with the water for hydration. The average adult is given about 150 Gm. each day in this form at a rate slow enough for it not to be lost in the urine. Although there is a slight individual variation, factors which alter the rate at which dextrose will be retained when administered intravenously are weight of the patient, altered metabolism due to sepsis or thyroid dysfunction, diabetes and disturbed liver function. Presuming normal thyroid, pancreatic, kidney and liver function and in the absence of high fever, the average 150 pounds (68 Kg.) patient will retain about 50 Gm. of dextrose each hour if administered intravenously at a constant rate. For this reason 5 per cent dextrose solution given for caloric requirement or to increase reserves is not given faster than 1 liter in an hour. If 10 per cent dextrose solution is given for the same purpose, it is given no faster than 500 cc. per hour. More rapid administration results in loss of the dextrose in the urine and in addition promotes dehydration and loss of electrolytes other than dextrose. Protein requirements for nutrition are difficult to place on a rational basis if proteins are administered

intravenously. Unknown factors in protein metabolism and variations in rate of loss and initial reserves in wounded persons make this true. Pooled human plasma contains about 70 Gm. per liter. It is our practice to administer about 500 cc. each day to a patient who cannot take protein by mouth, unless subnormal plasma protein determinations or disturbed albumin:globulin ratios exist. In the event of these findings increased amounts of plasma are given.

Recently intravenous amino acid preparations have been given in a few cases. Our use of these has been very limited, but, based on the experience of others, preparations of these kinds offer much promise in the future as available sources of proteins for nutritional purposes.

In addition to maintaining high protein, high carbohydrate and adequate salt reserves, particular attention is paid to vitamin needs. Vitamin deficiency, if allowed to occur in patients depending on parenteral feeding for nutrition, may complicate recovery immeasurably. The prevention of deficiencies yields more gratifying results than attempts at correction after deficiencies occur, but they frequently exist prior to the time of injury. This is particularly true of patients received at a general hospital. The amounts of vitamin A, B, C, D and K to be given vary greatly according to the estimated state of general nutrition before injury, the presence or absence of symptoms of specific vitamin deficiency and the expected lapse of time before adequate enteral intake can be begun.

Patients who receive large amounts of dextrose for caloric requirement should receive thiamine, riboflavin and niacin in the ratio of 1:2:10, as recommended by a joint committee of the Council on Pharmacy and Chemistry and the Council on Foods and Nutrition of the American Medical Association.³ For maintenance, 2.5 mg. of thiamine, 5 mg. of riboflavin and 25 mg. of niacin may be considered sufficient. If there is clinical evidence of a specific vitamin deficiency, the basic formula may be supplemented by additional amounts of the deficient vitamin or vitamins. Brewers' yeast is used extensively as soon as it can be tolerated orally. Vitamins A and D are given as indicated for fulfillment of maintenance requirements or for manifested deficiencies. Vitamin A deficiency, if allowed to continue, may predispose to intercurrent infections.

In protracted hemorrhage or for patients on nothing or little by mouth after injuries to the gastrointestinal tract, prothrombin deficiencies may exist. Synthetic vitamin K and fresh blood plasma are the materials used to correct hypoprothrombinemia. In order to aid wound healing, vitamin C in doses of 100 to 500 mg. a day is administered parenterally to patients who have wounds in which healing appears to be delayed and who are on nothing by mouth. The determination of the plasma vitamin C content is helpful as a guide to adequate dosage.

ANEMIA

Anemia may exist as a result of blood loss at the time of injury and during operation; it may antedate the injury or it may be secondary to sepsis following injury. In any event poor oxygenation of tissues will delay wound healing and general recovery. In the treat-

ment of anemia either whole blood or red blood cells suspended in 5 per cent dextrose and isotonic solution of sodium chloride are used. The suspensions are by-products of the blood bank obtained during plasma production and are available in large amounts, since plasma is processed for all hospitals in the metropolitan area. These are given to patients with anemia whose enteral protein intake is adequate. One pint of whole blood or the cell equivalent in suspension can usually be depended on to elevate the red blood cell count by about 400,000 cells and the hemoglobin by 1.1 Gm. This is provided a febrile reaction does not occur and the blood is less than four days old. Older bank blood, in which hemolysis of the red cells is advanced, is very effective, however, in the treatment of anemia. The response in the red blood cell count and hemoglobin is delayed when compared to that obtained when fresher blood is given, but the products of hemolysis are evidently a readily available source of supply for regeneration of red blood cells and hemoglobin.

It is well to mention here that, whenever a transfusion of blood is repeated after an interval, Rh— blood should be selected for any recipient whose cells are Rh—. It has been well established by Wiener⁴ and confirmed in this clinic as well as by others that earlier transfusion of Rh+ blood cells to an Rh— individual may result in the formation of immune anti Rh agglutinins. The subsequent transfusion of Rh+ cells after an interval of several days may result in a hemolytic transfusion reaction. These reactions are not usually as severe as those due to incompatible A and B factors, at least as far as incidence of mortality is concerned, but they jeopardize opportunities for recovery and defeat the purpose of a transfusion given for anemia. At present in this clinic Rh determinations are made, regularly, but Rh+ blood and Rh— blood are given indiscriminately to Rh— recipients in order to make a statistical study of the incidence of reactions.

SUMMARY

Improved supportive management of severely injured persons has yielded gratifying results in many clinics. It has been made possible by a combination of efforts. Fundamental observations made on the mechanisms which operate in shock and in severe hemorrhage have led to a clearer understanding of the indications for substances to be used to prevent or correct disturbances. Likewise, this is true for incorrect water and acid-base balance, defective nutrition and anemia. The development of laboratory tests and standards for objective appraisal of the patient have contributed. Improvements in the quality of supporting substances and in facilities for their availability and administration have been made in hospital and commercial laboratories. Examples of these are carefully operated blood and plasma services, and the preparation of solutions to which the best known standards for safety and quality are applied.

A factor of equal importance in the provision of optimum supportive therapy to wounded persons has been the dissemination of knowledge to the practicing physician through medical literature. Continued investigation of newer substances such as various blood substitutes, protein fractions and vitamin complexes no doubt will add to his armamentarium in the near future.

3. Report of the Council on Pharmacy and Chemistry and the Council on Foods and Nutrition: The Proper Use of Vitamins in Mixtures, J. A. M. A. 119:948 (July 18) 1942.

4. Wiener, A. S.: Hemolytic Reactions Following Transfusions of Blood of the Homologous Group, Arch. Path. 32:227 (Aug.) 1941.

THE MANAGEMENT OF HEAT BURNS

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Current medical military reports reveal that heat burns constitute one of the most serious problems to manage in the present war. From past and present experiences we know that these cases are no less difficult to treat in civilian practice. It is not inconceivable that such injuries of this category will occur in large numbers from sabotage, in industry producing ammunition and inflammable materials and may even result from enemy bombing. These possibilities should excite the interest of every physician regarding the treatment of the burned patient. Further, it might be a sagacious plan for every hospital throughout our land to develop a definite program utilizing a "burn team" which would facilitate the handling of these cases. Many hospitals have already instituted such measures.

A burn represents thermal injury to the skin and underlying tissues. Such injuries have been classified by most observers as being first, second and third degree. More important is the extent of the involved area rather than the depth of the injury. Although cutaneous destruction alone is a vital pathologic feature in cases of burns, the disturbances which proceed after this occurrence are equally important. Death of skin immediately suggests loss of normal surface protection, loss of function of the sebaceous and sweat glands and loss, in part, of the normal mechanisms for control of heat radiation and fluid balance. The exact effect of these disorders has as yet not been shown.

The second phase of abnormal physiology is concerned chiefly with the effect of the injury on the vascular system. The fluid which exudes from the burned surface and which shifts from the vascular bed to the tissue in and about the burned area, creates one of the most distressing features of the injury. Lowering of blood plasma volume produces a relative increase in the volume of cells in the blood.

At the present time nearly all observers believe that this state of hemoconcentration is largely responsible for the production of "thermal shock" seen in serious burns. Accurate and complete realization of these basic principles will insure a more practical and scientific approach in the treatment of such cases.

Heat burns may, for the sake of simplicity, be divided into major and minor injuries. Any burn whose area represents more than 10 per cent of the total body surface (Berkow's chart) should be classified as major and warrants hospitalization. It is not unwise to hospitalize every infant or child with a burn regardless of the extent of the injury.

In any major burn there are two fundamental points of approach to therapy. These are (1) general treatment of the patient and (2) the definitive treatment of the burned area. There is really no question concerning the importance of the first approach and, in general, nearly every one is in agreement with the principles advocated. The main fault lies in the fact that we fail to see them instituted and become more concerned about treatment of the burned area. In most instances this is the most important factor. There is no universal agreement regarding care of the burned area. The "pros and cons" are likely to exist until a decidedly more

ideal local method of therapy is found. The utopia desired is one which fulfils the factors of rapid application, simplicity, sterilization and protection of the wound, minimal plasma loss at the site of injury, comfort and ease in handling the patient and, above all, one which affords rapid epithelization or which promotes a granulating wound that may be grafted early, thus minimizing both loss of time and of function from such injury.

GENERAL TREATMENT OF THE PATIENT

The considerations under this division may be divided into immediate first aid measures and hospital treatment.

First Aid Measures.—At the time of a serious catastrophe confusion usually exists and in many instances the persons dealing with the victims apply measures that are contraindicated and harmful to the patient. In extensive burns, physicians should discourage the application of ointments, oils and various "home remedies" to the burned area by advocating the use of dry clean sheets or towels if dry sterile dressings are not available. Physicians should continue to encourage good general first aid principles. The patient should be kept warm. Small amounts of hot drink may be taken. If at all possible a sedative should be given, an accurate record being kept as to time and amount administered. Attention should be focused on efficient and rapid hospital disposition.

Hospital Treatment.—At the hospital all persons connected with the care of these patients should be properly capped and masked in an effort to lessen further contamination of the wound for which treatment is being instituted. A rapid general survey may be done including a brief history, a physical examination as far as possible and immediate laboratory procedures, including urinalysis and complete routine blood studies. In our clinic heparinized blood is obtained for hematocrit and plasma protein determinations. Although the latter observations are not absolutely essential, they are nevertheless useful in the guidance of fluid therapy.

It is agreed that pain suffered by the seriously burned patient is an important factor in the production, progress and prolongation of "thermal shock" which may result. It is to be remembered that such patients can tolerate and should have large doses of morphine. In many instances twice the normal dosage should be administered. Control of pain in children is as important as it is in adults.

Since the extensively burned patients rapidly lose their plasma volume, plasma should be given. "Thermal shock" can to a great degree be prevented by the early dispensation of blood plasma, serum, human albumin or any other adequate blood substitute. Even if present when the patient is first seen, the administration of plasma may be a life saving device, provided an irreversible state has not already ensued. Watchful waiting for signs such as a low blood pressure and a failing circulation before instituting plasma therapy to raise the plasma volume is to court disaster. The best index of need for therapy, as well as the control of plasma administered, is either hematocrit or hemoglobin determination in conjunction with the red blood cell count. In the early period of the injury whole blood transfusion may be harmful, for as plasma continues to be lost the red blood cells remain. To produce further hemoconcentration will only increase the degree of shock rather than lessen it. While whole blood is useful

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when anemia occurs, it should not be given in the early course of such an injury unless severe anemia is present. Crystalloid solution should be used with care. A solution of 5 per cent dextrose in isotonic solution of sodium chloride may have advantages over sodium chloride solution alone. In a state of hypoproteinemia too much sodium chloride may cause intensification of the local edema. We have preferred to give blood plasma by the intravenous drip route, using twice normal dilutions. In some instances it has been given intrasternally and also by subcutaneous infusion. It is important to remember that plasma should be continued as long as serious hemoconcentration exists.

In extreme burns the administration of oxygen may be beneficial. We have instituted nasopharyngeal oxygen on admission to the receiving unit. In some instances continuation of oxygen therapy is indicated for days or until all signs of anoxia are gone.

The administration of adrenal cortex extract remains in an experimental state. Although its use may not be harmful there is no absolute proof that it lessens the degree of "thermal shock." Usually we give an initial 2 cc. dose intravenously and then 1 cc. by hypodermic injection every four hours thereafter.

Recent experiences both in our clinic and elsewhere suggest that local sulfonamide therapy is contraindicated. Furthermore, investigation has rather conclusively shown that sulfonamide drugs are far more effective given systemically, particularly if given early. The routine use of intravenous sulfonamide medication is not without danger or complications. If there are no contraindications, sulfadiazine may be helpful in the control of local infection. We have given 2.5 to 5 Gm. intravenously as the initial dose and then 1 Gm. either every four or six hours as desired. The important consideration is control of the drug. A daily urinalysis and white blood cell count should always be done. A blood sulfonamide level is indicated at least every other day. With the appearance of any danger sign the drug should be discontinued.

DEFINITIVE TREATMENT OF THE BURNED AREA

Only after general therapeutic measures have been started should one consider definitive treatment of the burned area. Recently Koch and his associates¹ presented a new approach to this problem. We² have confirmed their observations. In many respects this method of dealing with the burned area appeared too revolutionary, yet on careful analysis it embodied basic fundamental principles regarding wound care, whether the result of a burn or another traumatic agent.

Briefly reviewing this method, it will be recalled that the burned patient is treated under ideal antiseptic conditions. With or without anesthetic agents the involved areas are cleansed gently with white (neutral) soap and water, using soft sterile cotton pads. This procedure is done with the least possible trauma. All loose devitalized skin is removed and all blisters are broken. After adequate cleansing (about ten minutes) the involved regions are flushed with quantities of isotonic solution of sodium chloride. The wounds are covered with sterile

fine meshed gauze impregnated with petrolatum or hydrous wool fat. This dressing does not adhere to the raw surface as a coagulant crust, it does not fix and destroy viable tissue, yet it still permits drainage into the dressings outside it.

The pressure dressing is completed by placing flat gauze on top of the nonadherent dressing. A uniform pressure dressing is created by adding fluffed gauze plus either sterile mechanics' waste or sterile sea sponges. This pressure dressing can be maintained by using elastic bandages or muslin bandage plus adhesive tape as the final outer dressing.

When movable parts are involved, such as the upper and lower extremities, immobilization can be maintained by either sterile aluminum splints or light plaster casts. There is sufficient clinical evidence to show that such immobilization aids in the healing of the burned area. These dressings remain untouched for from ten to fourteen days unless one has good reason for their removal.

At the time of the initial dressing one can better evaluate the true picture both as to the degree of infection and, more important, the destroyed area of body surface. If large third degree granulating areas are observed, they should be immediately prepared for skin grafting. Early replacement of skin is important. First and second degree burns usually appear well at the time of the initial dressing. Third degree wounds in many instances appear dirty, owing to a combination of sloughing tissue and infection. In this instance wet dressings, usually boric acid or saline solution, are instituted. At the end of forty-eight hours treatment of the wound with a solution of sodium hypochlorite is begun in preparation for grafting. When the wounds are clean an ointment dressing is reapplied.

It is rapidly becoming a well established fact that the trend in the definitive treatment of the burned area is the pressure ointment type of dressing. We have used this method of therapy for the past three years and, although we recognize imperfections in it, we do, nevertheless, believe that it has advantages over other methods of definitive therapy. This method fulfils many of the factors to be desired, namely protection of the wound, comfort and ease in handling the patient and minimal plasma loss from the wound and promotes a granulating wound which may be grafted much sooner than third degree areas treated by the eschar methods. Furthermore, this dressing permits rapid visualization of the areas at any point in the progress of the case.

SUMMARY

It might be said that the modern trend in the treatment of the severely burned patient is first of all concerned with the general treatment of the patient and, secondly, with the definitive treatment of the burned area. Since there are at present so many different methods of local therapy we may well assume that no one method fulfils the ideal form of treatment. However, the tendency at the present time is to utilize a method which does not add further injury to an already injured patient and which at the same time is relatively simple, protects the injured area, allows minimal plasma loss from the wound, promotes comfort and ease in handling the patient and, above all, one which affords rapid epithelization or which promotes early grafting of the third degree wounds. It would appear that "primary cleansing, compression and rest treatment of burns" more nearly approximates the desired effect than any other treatment of choice.

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WOUNDS OF THE CHEST

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Chest injuries are quite properly divided, for clinical purposes, into two large groups: nonpenetrating wounds and penetrating wounds. The distinction is the obvious one that in the latter there is a break, greater or less in extent, in the normally hermetically sealed thoracic cavity, while in the former such a disruption does not occur. The categories are not entirely mutually exclusive, as an injury producing multiple segmental rib fractures, while not a penetrating wound, may nevertheless produce all the disturbances of physiology present in the most severe types of penetrating wounds. With such obvious exceptions, however, the classification of wounds as penetrating and nonpenetrating serves admirably for diagnostic and therapeutic purposes.

NONPENETRATING WOUNDS

Severe contusions of the chest wall producing such bizarre injuries as fractures of the sternum, chondrosternal separation of the ribs, traumatic rupture of a lung, traumatic asphyxia and contusions of the heart do occur in civilian life but are sufficiently rare that they may properly be omitted from the present brief discussion. Contusions producing fractures of the ribs constitute probably the commonest type of chest injury. Such injuries, however, are more properly within the sphere of fractures and are not germane to the present discussion unless such fractures are sufficiently numerous and extensive to produce a break in the rigidity of the chest wall or, by perforation of the visceral pleura, break the airtight seal of the pleural space. Finally, there are open wounds of the chest wall which do not penetrate the parietal pleura. Such wounds are those produced with cutting instruments or with stabbing instruments, such as ice picks or narrow bladed knives, which have been deflected, usually by the ribs or sternum, and spend their force dissecting along the superficial tissue planes of the thoracic cage. Wounds of this type are also occasionally seen, although quite uncommonly, when a bullet is deflected by the bony structures of the chest wall. Under these circumstances the missile will sometimes travel along a rib over an arc of as much as 135 to 150 degrees and on rare occasions is seen to encircle an entire hemithorax. Except for the necessity of ruling out penetration of the pleura, these wounds differ little, if at all, from similar wounds elsewhere in the body. One exception, however, may be indicated. Practically all lacerations and stab wounds, and the majority of bullet wounds, are sustained during fights. The outer and intermediate layers of the thoracic cage are made up of the muscles controlling locomotion of the arm and, considering the vast range and complexity of these motions, it is virtually impossible to know in what relationship these muscle layers stood to the skin at the time injury was sustained. For this reason it is thought inadvisable to attempt a complete excision of the wound except on those rare occasions when the entire wound is visible. To attempt such an excision under other circumstances either would necessitate an unjustifiably large removal

of tissue or would entail blind probing, involving an unjustifiable amount of tissue trauma. It is thought better in most instances, therefore, to be content with débridement of the obvious wound in the superficial structures with loose primary closure.

PENETRATING WOUNDS

As already noted, the characteristic feature of penetrating wounds lies in breaking the seal of the pleural space. The resultant alterations in the dynamics of respiration and circulation produce phenomena so profound and unique as to separate wounds of the chest from all other types of injury. Space does not permit a repetition here of the already familiar mechanics of respiration, but a knowledge of these pressure relationships is absolutely indispensable to an understanding of the clinical phenomena observed, an appreciation of the gravity of the injury and the uncertainty of prognosis, and an intelligent approach to the treatment of such injuries. It is presumed, therefore, that the physician essaying to handle such injuries will have thoroughly familiarized himself with the normal physiology of respiration and circulation as well as with the mechanical possibilities when the conditions necessary for such normal physiology are altered.

While there are numerous methods of classifying penetrating chest wounds, probably the simplest one is that based on the anatomic structures injured. The least complicated type of penetrating chest wound encountered is that in which the perforating weapon is small, passes through the thoracic wall with minimal trauma and opens the parietal pleura without injury to the underlying visceral pleura. Considering the extremely narrow margin involved, it would seem theoretically that the incidence of such wounds should be relatively small. One is rather surprised, therefore, at the large number of wounds of this type encountered in a large traumatic service. The only proof, of course, of such an occurrence is the presence on x-ray examination of a thin layer of air separating the pleural surfaces or a small cap of air over the apex of the lung on an upright film. Obviously a similar finding can be produced by a very minute perforation of the visceral pleura which seals off almost immediately. The practical clinical problems involved in each instance being identical, however, the distinction is hardly necessary. Treatment of this type of injury is the basic therapy for all penetrating chest wounds. The patient is treated for shock, if present. The involved hemithorax is immobilized, particularly at the base, with an adhesive strapping extending beyond the midline anteriorly and posteriorly and applied with the patient in extreme expiration. The patient is kept in bed in high Fowler's position for a period varying from five to ten days, and sufficient morphine is administered to keep him quiet. He is watched very carefully, particularly during the first twenty-four hours, for the development of any additional phenomena, and these are treated according to their nature.

Between the foregoing and the next more serious type of injury lie all degrees of wounds with comparably increasing amounts of simple pneumothorax. When, however, the opening in the thoracic wall is sufficiently large to permit free to and fro movement of air, a much more profound picture develops. Such patients experience immediate and grave shock. Not only is the lung on the injured side completely collapsed but, owing

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to the distortion in pressure relationships, the opposite intact lung undergoes a serious reduction in its capacity, resulting from the paradox in respiration transmitted from the injured side. This enormous embarrassment to respiration is further complicated by an even more serious burden imposed on the central circulatory mechanism. Not only does mediastinal flutter reduce circulatory efficiency to a dangerously low level but the twisting character of this swing, induced by the rotary motion of the heart beat, initiates reflexes in the extracardiac autonomic nervous control mechanism the results of which, while not clearly understood as yet, undoubtedly have an extremely grave effect on the entire vasomotor control mechanism of the body, central as well as peripheral. This is empirically evident from the fact that, even despite prompt closure of the defect in the thoracic wall with subsequent complete evacuation of the pneumothorax, it is very difficult and not infrequently impossible to retrieve the patient from the shock incident to the initial injury. Treatment of such wounds consists in immediate closure of the opening in the chest wall with anything handy. Clothing, towels or surgical dressings, moistened if possible but dry if necessary, should be placed over or into the defect until the patient can be properly treated. This is one of the few instances in which treatment of the injury proper takes precedence over treatment of shock and in which considerations of sterility and contamination must be abandoned to the extreme urgency of the patient's condition. Preferably such patients should be treated definitively at the place of injury rather than being transported, but such a possibility rarely occurs in civilian life. This being so, the patient is given whatever therapy is available to impede the progress of shock and then transported with maximum expedition to a point where more complete treatment can be carried out. Whenever possible, treatment of shock and of the wound itself should be carried out simultaneously; but when the opening in the chest wall has been securely closed, treatment of the chest can be limited at the most to an attempt to aspirate the pleural cavity in an effort to increase available pulmonary capacity. It is not only safe but probably better judgment to expend as much as two or even three hours in reducing the patient's shock rather than to subject the patient to definitive therapy while still in this grave condition. Obviously, when no progress is being made in relieving the shock, one should not continue to rely on such fruitless measures alone. In this instance direct therapy to the chest is carried out intercurrent with the treatment of shock.¹

Under positive pressure oxygen the emergency dressing is removed and, ideally, the remainder of the procedure carried out under field block local anesthesia. It is believed that, unless absolutely necessitated by the patient's inability to or unwillingness to cooperate, inhalation anesthesia is to be avoided because of the incipient danger of subsequent pneumonia. When the use of inhalation anesthesia is inescapable, cyclopropane is preferable to ether. Anesthesia having been secured, the wound in the chest wall is thoroughly excised and all local bleeding controlled. The lung is then examined carefully for breaks in the visceral pleura, and these are closed if possible. The pleural cavity is then thoroughly irrigated with saline solution. Larger

wounds of the lung will be considered later. The use of sulfanilamide in the pleural cavity has been subject to some question recently, but until more conclusive evidence of its deleterious effects is adduced it is felt wiser to use this drug in the pleural cavity prophylactically. The defect in the chest wall is then closed by approximating the adjacent ribs with stay sutures of some strong material such as silkworm gut, kangaroo tendon or steel wire. These materials may be buried beneath the skin or used as through and through sutures to be removed subsequently. Transected muscle layers are approximated and the skin is closed tightly. If the pleural cavity is thought to have been sufficiently contaminated, closed drainage with a catheter may be established at a point away from the initial wound. Preferably, however, the chest is closed without such drainage. Following closure the pleural cavity is evacuated of air by passing a large needle into it and then expanding the lung under positive pressure. All of the foregoing presupposes, of course, that the patient has been relieved of his shock and is in condition to withstand such operative manipulation. When there is any question as to the patient's condition it is wiser to be satisfied with simply removing the emergency dressing and substituting for it closure by through and through stay sutures passed about the ribs above and below the wound, and the application of a large sealed dressing, leaving to chance the possibility of infection developing.

The derangement in physiology that has been described is produced in another fashion by a third type of wound. In these cases the opening in the thoracic wall is relatively small but the nature of the injury, usually a tangential wound, produces a valvelike mechanism through which, on inspiration, air enters the pleural cavity but on expiration is unable to escape. The result is a tension pneumothorax in which intrapleural pressure builds up rapidly with consequent displacement of the intrathoracic viscera. Here the embarrassment is mainly respiratory, from reduction in available lung capacity, and the factor of circulatory distress, so prominent in open sucking wounds, is of less relative significance. Notwithstanding this, such a patient's condition is very grave and must be relieved promptly to avoid death. Treatment consists in decompression of the pneumothorax through a needle or catheter connected with a tube which discharges the pleural air under water. This decompressing mechanism having been established, the traumatic opening is closed and the lung allowed to reexpand. When the thoracic wound is limited to the chest wall it is better to use a needle for decompression, removing it when the lung has reexpanded; but if the situation is complicated by hemothorax or there is a question of the lung itself having been lacerated, the catheter is the preferable instrument and it is left in place until the danger of further pleural pathologic conditions has passed.

The foregoing types of chest wounds can and do occur simply or they may be associated with bleeding of considerable degree from the chest wall into the pleura. Such bleeding occurs most frequently as a result of the intercostal vessels having been involved in the wound. The position of these vessels beneath and behind the shelving inferior rib margin makes it easier for bleeding to occur into the pleural cavity than to the surface of the body. Occasionally bleeding arises from a severed internal mammary vessel, but it is felt

1. The reader is referred to the article by Dr. Howarth for a detailed description of shock therapy.

that hemorrhage from one of these vessels is less frequent than is customarily supposed. Unfortunately, experience demonstrates that such an error in diagnosis is made in some instances in which the pericardium or the extrapericardial great vessels of the mediastinum are the true source of hemorrhage. Certainly involvement of these latter structures must be eliminated conclusively before the diagnosis of a bleeding internal mammary vessel is acceptable.

Hemothorax resultant from such injuries is usually associated with a greater or less degree of pneumothorax. The diagnosis is made by the customary physical findings plus x-ray evidence. In this variety of hemothorax, in which an intact lung continues to expand and contract, bleeding is controlled when sufficient tension is reached. It is preferable, therefore, to treat such patients conservatively, allowing the body to resorb the blood, unless the hemothorax has reached sufficient size to produce respiratory embarrassment. Even then the hemothorax should be decompressed guardedly, 500 cc. of blood being somewhat arbitrarily the maximum to be removed at one time, and that replaced with about 300 cc. of air in order to continue the pressure tamponade on the bleeding vessel lest the hemorrhage be renewed. It is usually found under these circumstances that the intrapleural blood is quite fluid, having been defibrinated by the churning movement of the lung.

In the majority of serious penetrating thoracic wounds the problem is further complicated by injury of the lung. The amount of pulmonary damage varies all the way from tiny wounds, involving a minimal amount of peripheral lung parenchyma, which seal themselves automatically, to great gaping lacerations crossing main stem bronchi and great hilar vessels. Obviously, in the majority of instances the wound will lie between these two extremes and closer to the less serious than to the more serious. Findings in these patients are almost invariably those of a mixed hemo-pneumothorax, the predominating element depending on the size of the pulmonary vessels involved. Except when a valvelike wound in the lung has been produced, pressure pneumothorax is relatively uncommon and control of hemorrhage is the more important problem. Usually this control is established automatically, but frequently at the expense of considerable loss of blood. The break in the visceral pleura causes immediate and usually complete collapse of the lung with loss of the tamponade provided by this structure when intact. For this reason it is thought inadvisable to remove the intrapleural blood unless respiratory embarrassment makes such a measure imperative, a situation unlikely under the circumstances. In the majority of instances conservative treatment will suffice. However, there is an increasing belief that, when pulmonary damage is great enough to produce shock which responds poorly to intensive therapy, the results of conservative handling have been so poor that more radical measures should be employed. Both at operation and at autopsy it has been found that such bleeding does not confine itself to the massive hemothorax. There is gross dissecting interstitial pulmonary hemorrhage. Another indication of the inadequacy of conservative therapy is the finding in some cases of a laceration of one of the great pulmonary vessels, hemorrhage from which could be controlled only by ligation. The measures to be employed in operative treatment of these injuries

will vary with the nature and degree of injury encountered in the individual case and include such procedures as simple pneumoplexy, exteriorization of the injured portion of the lung, partial or complete lobectomy or, if necessary, pneumonectomy. It should be pointed out that, when a relatively simple wound in the lung is complicated by injury of a great pulmonary vessel, the only procedure necessary is ligation of the vessel. The pulmonary circulation is not the nutrient blood supply to the lung, on the one hand, and the anastomoses of the pulmonary venous circulation are ample to provide sufficient decompression when the injured and ligated vessel is a pulmonary vein.

Penetrating thoracic wounds are occasionally complicated by the fact that both the pleural cavity and the peritoneal cavity are opened and made to communicate. These wounds are particularly serious when the hollow abdominal viscera are perforated and the pleural cavity contaminated with gastric or intestinal contents. The natural tendency, particularly when the penetrating thoracic wound is relatively small, is to explore the abdomen, closing perforations of the viscera, and to treat the thoracic injury conservatively. In view of the extremely high mortality in cases so handled, it is more and more becoming the opinion of clinicians seeing this type of injury that the better procedure is to treat both cavities radically, exploring the abdomen first and thereafter doing an open thoracotomy, cleansing the pleural surfaces thoroughly by repeated saline irrigations and closing with catheter drainage after instillation of sulfanilamide prophylactically. Whether or not this extremely radical point of view will result in a reduction in mortality from this type of injury is as yet conjectural. It can scarcely increase mortality except in speed of demise.

One major type of penetrating chest wound remains, namely wounds involving the mediastinum and its structures. For practical purposes such wounds may be considered as injuries to the pericardium and its contents. The numerous repetitions of the presenting clinical picture in these wounds cannot be overemphasized. While the pericardium and heart can be injured from almost any position in the chest circumference, the vast majority of such injuries result from weapons penetrating the anterior thorax. It has been found that the only safe criterion to follow is an extreme one. To rely on the probability that penetration of the pericardium is likely only when the wound of entrance is in the so-called vulnerable triangle of the left anterior midthorax or that pericardial wounds are improbable when the point of entrance is in the right hemithorax is to court disaster. When a chest wound enters the anterior thorax anywhere between the midclavicular lines, a wound of the pericardium and heart must be ruled out rather than in. A further precaution is recognition of the fact that, while the clinical picture of tamponade is pathognomonic of intrapericardial injury, the absence of this picture does not preclude such injury. The clinical picture in wounds of the heart and other intrapericardial structures depends in large measure on the nature and position of the wound in the pericardium. If this opening is small enough or so placed that hemorrhage from the heart wound cannot escape, tamponade of cardiac movement results. Classically, such a pathologic condition is manifested in the Beck triad of acute cardiac tamponade, viz. a falling arterial pressure, a rising venous pressure and

a quiet heart. The entire picture is not always present, however, and even when present is not always recognized. The first finding may very well be misinterpreted as a sign of ordinary shock, while the third, being entirely dependent on personal interpretation, can easily be overlooked. Of the three the elevated and rising venous pressure is the one most constantly seen and least subject to misinterpretation. Auxiliary but less constant clinical guides are paradoxical pulse, distention of the veins of the neck and reduction of cardiac excursion when viewed fluoroscopically.

If, on the other hand, the opening in the pericardium is sufficiently large or so placed that bleeding from the heart wound can decompress itself into the pleural or peritoneal cavities or to the outside, tamponade will fail entirely to develop. The clinical picture then will be one of most profound hemorrhagic shock. Incredible as it may seem, patients so injured do not die immediately. In fact, they can and do live for extraordinarily long periods of time. In these cases practically the only criteria for a diagnosis of wounds of the heart are the position of the wound of entrance and the profound degree of shock. It has been found that not a few injuries diagnosed ante mortem as severe pulmonary injuries are demonstrated at autopsy to have been undiagnosed intrapericardial wounds. In this type of heart wound both arterial and venous pressure will be very low, if at all demonstrable.

Except under the most unusual and clearcut circumstances of minimal intrapericardial bleeding, the therapy indicated in all heart wounds, whether with tamponade or with gross hemorrhage, is operative. This consists in closure of the heart wound, thorough evacuation of blood clot from the pericardium and loose closure of the operative wound in the pericardium to permit adequate decompression of the effusion which invariably follows such operative intervention. Mortality from wounds of the heart, in the hands of interested and experienced clinicians, has been lowered during the past ten years at a most gratifying pace. The current death rate in clinics seeing an appreciable number of these patients is about 23 per cent.

COMMENT

The foregoing outline of thoracic wounds is obviously not exhaustive. Such a complete exposition of the subject would be possible only in monograph form. It is believed, however, that the major types of thoracic injury have been enumerated and the salient differences, both in the nature of the pathologic changes produced and in the indicated therapy, outlined. In recapitulation it should be pointed out that it is the penetration of the pleural cavity with the consequent distortion in the mechanics of respiration and circulation that distinguishes thoracic wounds from those in other portions of the body. Such aberrations in these life sustaining physiologic mechanisms do not allow much margin of safety and demand of the physician a thorough understanding and appreciation of the normal physiology and of the disturbances resultant from disruption of this mechanism. Therapeutically such wounds require prompt attention and, not infrequently, delicately balanced judgment. The past twenty-five years, with the enormous progress made in this field of traumatic surgery, is ample demonstration that the effort expended and the risks and responsibilities accepted by pioneers in this field have been generously rewarded.

PENETRATING WOUNDS OF THE ABDOMEN

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The operative treatment of penetrating wounds of the abdomen has changed but little in the past twenty years. Lower mortality has been attained chiefly by the introduction of improvements in anesthesia, by the more liberal use of blood and plasma transfusions, by the postoperative use of continuous gastric suction and by the use of the sulfonamide drugs. A patient presenting himself with a penetrating wound of the abdomen should be examined quickly but thoroughly to see, first, if he is in shock, second, the nature and extent of the external wound and evidence as to the direction of the stab or gunshot wound, and, third, for signs of peritoneal irritation. Local exploration of the wound, except under anesthesia, is usually not a wise policy, for it may spread infection to probe it and may lead to erroneous conclusions as to whether it penetrates the peritoneal cavity. In cases of doubt, exploratory laparotomy should always be performed, and only when complete exploration of the wound demonstrates that the peritoneum is not implicated can laparotomy be safely omitted. On account of the high mortality rate in gunshot wounds of the abdomen with operation, attempts have been made in the past to treat groups of patients by nonoperative methods. This has uniformly led to higher death rates than with operation, so that conservative management has been abandoned except for patients at the point of death or those who have survived for several days before reaching a hospital.

If shock is present it should be the first thing treated. In our experience the most important cause of shock in penetrating wounds of the abdomen is hemorrhage, and therefore transfusion of whole blood is the procedure most clearly indicated. With an adequate blood bank, blood for this purpose is available as soon as typing can be carried out, and it should be given promptly. Other than the treatment of shock, little preoperative preparation is necessary, unless some intra-abdominal structure protrudes through the wound. In such cases the peritoneal mass should be washed gently with isotonic solution of sodium chloride and covered with moist sterile gauze until the patient reaches the operating room. Only rarely is there severe bleeding from the abdominal wall and this can usually be controlled by pressure or packing, though occasionally it may be necessary to clamp and ligate a vessel. In cases of gunshot wounds it is often desirable to examine the patient with the fluoroscope before operation to see the position of any retained bullet or bullet fragments. By seeing the bullet and knowing its relationship to the wound of entrance one can often get a fairly good idea of what intra-abdominal structures may have been traversed. For anesthesia, our preference is for cyclopropane or ether or a combination of these, using an intratracheal tube and a closed system. Many patients who are brought to the hospital with penetrating abdominal wounds have a full stomach, and there is

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often considerable danger of vomiting during the induction of anesthesia with aspiration of material into the trachea. Rapid induction, using cyclopropane, reduces the risk considerably. In most instances our patients are given morphine $\frac{1}{6}$ grain (0.01 Gm.) and scopolamine $\frac{1}{150}$ grain (0.0004 Gm.) about thirty to forty minutes before induction. Some years ago a group of patients with penetrating wounds of the abdomen were treated at this hospital with an attempt to empty the stomach by lavage before operation. This proved to be wholly unsatisfactory and had to be abandoned. Frequently the patients would not be able to take the tube without vomiting and, once started, it often continued through the induction period. Even if the tube was passed successfully without vomiting, the food particles in the stomach were usually found to be too large to go through the tube. Now, with adequate sedation and rapid induction, followed by intratracheal intubation, the incidence of aspiration pneumonia has dropped almost to the vanishing point.

Combined penetrating wounds of the thorax and abdomen offer a particularly bad prognosis. The pneumothorax which is almost invariably present increases the degree of shock and renders the patient less able to withstand the operative procedure required. In addition, with wounds involving the left diaphragm and stomach, gastric contents may enter the left pleural space and produce an ideal setting for the development of empyema. In such cases the thorax usually should be opened and the pleural surfaces cleansed mechanically and washed with isotonic solution of sodium chloride. Sulfanilamide powder is then placed in the cavity and tube suction drainage instituted. If there is no gross soiling of the pleural cavity, the thoracic cavity is closed as the lung is reexpanded by increasing the pressure in the intratracheal tube.

The causes of penetrating wounds of the abdomen somewhat varied. The commonest ones in civil practice are ice pick, knife, razor, pistol, rifle and shot gun. In a series of 43 cases at the Cincinnati General Hospital 26 were the result of knife wounds and 17 of gunshot. The high mortality which has always been present with such wounds is due principally to hemorrhage, and to peritonitis from the perforation of hollow viscera, although, in the past, pneumonia or some other complication was also a prominent cause of death or factor contributing to a fatal outcome.

Hemorrhage may vary tremendously from practically none to exsanguinating loss from perforation of large vessels such as the renals, mesenterics or even the vena cava. Perforation of a solid viscus such as the kidney, liver or spleen may also be associated with a great loss of blood. Retroperitoneal hemorrhage may be quite extensive and particularly difficult to control.

Infection results principally from gross spilling of gastrointestinal contents from visceral perforations, though it may occasionally be due to material such as bits of clothing or other foreign material being carried into the wound. In civil practice most penetrating wounds occur as the result of fights after eating or drinking, and the extravasation of recently ingested food from the stomach is particularly bad. Material from the duodenum and upper ileum does not usually lead to serious infection, but that from the lower ileum and colon may cause severe contamination.

In the management of cases of wounds of the abdomen a sterile dressing is applied as soon as possible to any open wound, and the patient is treated for shock if this

is present. Blood is drawn for typing and, if shock is extreme, intravenous plasma is started immediately, to be replaced by whole blood as soon as typing has been carried out. Oxygen therapy may be indicated in some cases. After a negative skin test, prophylactic anti-tetanic serum should be given. The question as to whether the wound penetrates the peritoneal cavity and its direction or course may be one requiring some consideration and often considerable judgment. If frank signs of peritoneal irritation exist or if intra-abdominal viscera protrude, perforation may be considered as established. The absence of signs of peritoneal irritation does not rule out perforation and therefore cannot be relied on. While common sense and good judgment must be exercised, in general it is safer to make an exploratory laparotomy than to explore the wound locally or to await the development of untoward symptoms. Even in small wounds high up in the right side in the region of the liver, exploration is usually advisable.

The incision used should depend to a considerable extent on the nature and site of the wounds of entrance and exit. If the wound is large and associated with lacerated tissues, it should be debrided and extended to allow access to the peritoneal cavity. If it is small, it is disregarded or debrided locally and one of the accepted incisions for exploration of the abdomen used.

The exact procedure to be followed after the abdomen is opened varies with the character and location of the injury. In many instances, with extensive hemorrhage, the first and most important step is to find the bleeding point and stop the loss of blood. In others, bleeding is less active and control of spilling of gastrointestinal contents is more important. As a rule, with a patient under general anesthesia, continuation of spilling of gastrointestinal contents ceases except when viscera are manipulated, so that usually the control of hemorrhage is the first step. This may at times be difficult, for often the point of the bleeding is either retroperitoneal or between folds of mesentery, so that a spreading hematoma is present and the actual bleeding vessel may be hidden by the extravasated blood. This has to be squeezed out or expressed after incision of the peritoneal surface so that the actual bleeding point can be seen. After control of hemorrhage the next step is a complete and thorough examination of the entire gastrointestinal tract, literally from the cardiac end of the stomach to the rectum. A systematic inspection is essential in order to be certain that no perforations are overlooked, for failure to find and close just one hole may lead to fatal complications. One can be guided, of course, by the location of the wounds of entrance and of exit, but it is often surprising to find perforations where they would not have been expected from the location of the wounds of the abdominal wall. Perforations are most likely to be overlooked on the posterior wall of the stomach, in the duodenum and at the junction of the small bowel with its mesentery. In this last location the perforation may be obscured by a hematoma which must be evacuated completely so that careful inspection is possible. Perforations on the free serous surfaces of the bowel are usually easy to recognize and each one must be carefully closed. This is usually done with mattress sutures of fine silk with the suture line at right angles to the long axis of the bowel. By this method it is possible to turn in surprising amounts without unduly constricting the lumen. At times the bowel is so badly perforated or

its blood supply so torn that resection is necessary. This can be quickest repaired by dividing the bowel between Kocher clamps and doing an end to end anastomosis. Brush burns and bruises of the bowel caused by bullets usually need to be inverted even though no actual perforation is present at the time, for such areas may undergo gangrene and perforate if this is not done.

In wounds involving the lower part of the abdomen, special attention needs to be paid to possible perforation of the bladder or section of the ureter. If there is one hole in the bladder there is usually a second one which may be hidden extraperitoneally. Wounds in the bladder need to be sutured and a retention catheter then placed in the bladder after the operation is concluded. If a ureter is partially or completely severed, it may either be anastomosed or the proximal end implanted into the bladder and the distal end tied off.

Wounds involving the spleen usually require splenectomy. Wounds of the kidney occasionally demand nephrectomy, but this should be done only in case of almost complete destruction of the kidney or uncontrollable hemorrhage. As a rule the bleeding can be controlled by suture or packing. Nephrostomy may be necessary if the pelvis is badly damaged. Wounds of the liver, if small, require no treatment. In larger wounds, suture may be used to control bleeding. If the wound is quite large, it may be necessary to resort to a pack, which is brought out as a drain. Rarely the gallbladder is injured and needs to be removed. Wounds of the pancreas require drainage. Recently Naffziger and McCorkle¹ pointed out the value of the serum amylase test in the diagnosis of wounds of the pancreas and also as an index of progress after operation.

After seeing that all wounds of hollow viscera are closed and that major bleeding is controlled, one must consider the toilet of the peritoneal cavity. Foreign bodies, such as bits of clothing, or gun wadding, must be removed. Liquid contents of the stomach or bowel are removed as completely as possible with an aspirator. If solid fecal matter has escaped from the sigmoid or rectum it is removed as completely as possible, but unless it is found in an isolated area such as the cul-de-sac which can be washed out completely, irrigation is not used as it tends to spread the contamination rather than to wash away infective material. As a rule no drains are placed into the peritoneal cavity unless a pack or drain is necessary to control bleeding or unless the pancreas has been injured or the retroperitoneal space is contaminated. If possible, drains are brought out through a separate incision, often in the flank.

The management of viscera protruding through a penetrating wound requires special care. Any protruding mass is gently but thoroughly irrigated with isotonic solution of sodium chloride and covered with sterile gauze before the abdomen is opened. The skin up to the edge of the wound is washed thoroughly with soap and water and painted with skin disinfectant, as is the rest of the abdominal skin. If the protruding mass is omentum it may be grasped with a clamp or have a suture placed in it. Once inside the abdomen, the omentum can be divided and the protruding part pulled

out by the nurse and discarded. If bowel protrudes, it is, of course, drawn back into the abdomen.

Before the abdomen is closed sulfanilamide is dusted into the peritoneal cavity, 5 or more grams being used up to a maximum of about 8 to 10. It is well established that the intraperitoneal use of the sulfonamide drugs gives more favorable results in the contaminated peritoneal cavity than when frank peritonitis exists, and this is the situation most commonly present in penetrating wounds of the abdomen. As may be expected, therefore, the mortality rate in this type of injury has been substantially lowered with the introduction of the use of these drugs. The use of sulfonamide drugs intravenously before operation and their continued use after operation are being carried out routinely at some clinics. Our experience with preoperative sulfonamide drugs is still too scant for an opinion to be expressed. As a rule, no sulfonamide drug is placed in the laparotomy wound itself, as this has proved of little or no value in improving results or in reducing the incidence of complications. At the Cincinnati General Hospital the wound is closed with through and through silver or steel wire sutures according to the method described by Reid and Zinninger,² no other sutures being used. Some operators prefer to use a continuous suture of catgut to close the peritoneum, but I myself prefer to use no suture except the through and through wires and a few fine silk sutures in the skin. This method allows a very rapid closure even when there is considerable tension. It leaves little or no foreign body in the wound and allows secretions from the wound to escape between the sutures. It is very secure and prevents disruption of the wound even when there is considerable infection present.

After operation a tube is passed into the stomach for continuous gastric suction. With an intratracheal tube in place the gastric tube can be easily passed by the anesthetist while the abdomen is still open and properly located by the surgeon in the stomach. Otherwise the tube may be passed as soon as the patient reacts from anesthesia. The decompression afforded by the immediate use of gastric suction tends to place the bowel at rest and prevents distention, which might result in undesirable tension. The length of time it remains in place depends on the number and character of the perforations, on the general postoperative course and on the amount of fluid obtained through the tube. In patients progressing satisfactorily it is usually removed at the end of forty-eight to seventy-two hours, and liquids are then started in small amounts by mouth. Prior to this time all fluid and food are given parenterally as intravenous dextrose solution, amino acids, blood or blood plasma. In most cases sulfadiazine is given either intravenously or subcutaneously during this same period, with blood levels being determined every other day. Complications have to be treated as they develop, the most common being pulmonary atelectasis, pneumonia, wound infection, peritonitis and intra-abdominal abscess. If recognized and treated promptly, atelectasis can usually be prevented from becoming a serious complication. We have found that postural drainage and urging the patient to cough up the occluding plug is usually effective if applied promptly. The

1. Naffziger, Howard A., and McCorkle, H. J.: The Recognition and Management of Acute Trauma to the Pancreas with Particular Reference to the Use of the Serum Amylase Test, read before the American Surgical Association, May 13, 1943.

2. Reid, M. R.; Zinninger, M. M., and Merrell, Paul: Closure of the Abdomen with Through and Through Silver Wire Sutures in Cases of Acute Abdominal Emergencies, *Ann. Surg.* 98: 890-895 (Nov.) 1933.

technic used at the Cincinnati General Hospital was described by Moore³ several years ago and is still in use today.

During the past fifteen months we have treated 46 cases of penetrating wounds of the abdomen, 9 of which were combined wounds of the chest and abdomen. There were five deaths in this series, giving a mortality rate of a little less than 11 per cent. Two of the patients who died had gunshot wounds of the vena cava. Three were due to pneumonia or empyema, 2 of the patients having combined abdominal and thoracic injuries. This mortality rate is considerably lower than that which obtained several years ago and is due, it is believed, principally to improvements in anesthesia, to the use of adequate amounts of blood and plasma, to the use of continuous gastric suction postoperatively and to the introduction of the sulfonamide drugs.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. ALTEMEIER, SILER, CALDWELL, EVANS, HONWORTH, MCGRATH AND ZINNINGER

DR. SUMNER L. KOCH, Chicago: Altemeier has rightfully emphasized the importance of prompt arrest of bleeding in the care of wounds. It is sometimes forgotten that rapid hemorrhage takes place also from the surface and into the subcutaneous tissues after an extensive burn, and that this "white hemorrhage" is the most important factor in the production of secondary shock. To neglect local treatment of the burned area until shock has been controlled is analogous to permitting uncontrolled bleeding from an open wound until shock has been overcome. In the care of the lacerated open wound, one would agree that complete excision of the entire open contaminated wound is the ideal procedure but I realize from long observation of my own cases and those of others that it is difficult and often impossible to accomplish. The surgeon who attempts to excise *en masse* a contaminated wound too often after careful excision of ragged skin edge and crushed muscle finds himself confronted with crushed and contaminated tendons, nerves and bone fragments in the depth of the wound. To cleanse these essential structures and render them suitable for repair without recontaminating the freshly exposed skin, subcutaneous tissue and muscle is quite impossible even for the most skilful surgeon. Better results will be obtained both by the beginner and by the experienced surgeon by careful primary soap and water cleansing of the wound and excision of devitalized tissue after cleansing is completed. To say that prolonged wound washing is more likely to lead to infection than minimal cleansing is to overlook the fact that prolonged wound cleansing is inevitably carried out after extensive, badly contaminated and crushing injuries—the very type in which healing by primary union is most difficult to attain. With reference to infection of the hand, one would agree that prevention of infection by immediate and well considered treatment of open wounds is much more helpful than cure, once infection has developed. In the presence of infection one cannot stress too emphatically the importance of deciding at the outset whether an infection is a diffuse spreading invasive process or a localized infection. The treatment of the first type consists of rest, elevation of the part, application of large warm wet dressings and abstinence from active surgical treatment. It is for this type of infection that the sulfonamides have proved of undoubted value. It is in this type also that early surgical incision can prove disastrous and result in rapid and serious extension of an infection which might resolve or be converted into a localized process by wise and conservative management. I would like also to support Siler's advice to employ conservative treatment in the presence of osteomyelitis, whether associated with felon or secondary to other types of infection of the hand. With reference to frost bites, it is my belief that the changes in the tissues, though slower to occur,

are identical with those resulting from excessive heat and that the same principles of treatment should be applied—gentle cleansing, an adequate compression dressing and a splint.

DR. WILLIAM DARRACH, New York: The main purposes of the first treatment should include reduction of displacement with the decontamination of the wound and the arrest of hemorrhage. The original operation is the best time to get satisfactory alignment and perhaps the only chance to obtain an accurate restoration of length and axis. Dr. Caldwell's indications for débridement are susceptible of misinterpretation. Although many fractures, compounded from within, need merely skin margin excision, many others with more than minimal soft part laceration and undermining of skin require more extensive débridement. Rifle and machine gun wounds may be handled conservatively, but those caused by shell and bomb fragments require full exploration. Thorough débridement is often indicated when his description does not apply, namely "when the wound is large, obviously contaminated and is bleeding freely or fragments are extensively contaminated." The time elapsed between receipt of injury and the first operative treatment should be mentioned. Thorough débridement is applicable only during the early hours. After eight or twelve hours, when contamination has become infection, operative extension of the traumatized area must be limited. I disagree with Dr. Caldwell's objection to the use of metal internal fixation in compound fractures. I so thoroughly agree with his statement that "any movement of the fragments in tissue which still harbors bacteria may traumatize the tissue sufficiently to activate subsiding bacterial proliferation" that I feel every effort should be made to obtain rigid fixation. The latter does control infection as well as maintain length and axis. If the injured bone can be covered by soft parts without tension, it will save weeks of convalescence; but unwise closure may lead to extensive infection and serious complications. Some of the deciding factors are the site of injury, the time elapsed between trauma and primary operative treatment, character and amount of contamination, condition of patient and postoperative transportation. Serious infection is far less likely to develop in upper extremity cases than lower, thigh less than leg. Perhaps the worst are the lower leg cases in which the tibia has little muscle attached to it and therefore poorer blood supply.

DR. FRANK L. MELENEY, New York: I wish to discuss that phase of Dr. Altemeier's paper on bacteriology which deals with the degree and nature of the bacterial contamination. The bacteria are introduced into the wound by the instrument causing the wound, by carrying in foreign bodies which are attached to the instrument itself, in the clothing covering the victim or on or in his skin. If the missile comes directly from a gun and has a smooth surface, it may be relatively free from bacteria; but if it has a rough surface and if it enters the wound after contact with the soil—such as a bomb or shell fragment—it may carry in large quantities of bacteria. Every wound is contaminated with bacteria to a greater or lesser degree. There will be many different species. However, the organisms are concentrated in or on the foreign bodies and at the time of contamination are not generally distributed throughout the wound. Any attempt, therefore, to take cultures of the wound in an effort to find out what organisms are there cannot depend on introducing a swab into one portion of the wound or even rubbing it extensively over the surface. In order to find out what organisms are present, it is necessary to remove as much of the injured tissue and foreign material as possible and cultivate all of the material removed. The preliminary treatment of such a wound in an effort to prevent infection should have as its main purpose the removal of as many of the contaminating organisms as possible. If the wound is seen soon after the accident and the organisms are still on the surface, the débridement does not need to be as extensive as is necessary at a later stage when organisms may have multiplied extensively and may have invaded the tissues. The débridement should be primarily a dry débridement, removing the damaged tissue and foreign bodies by excision without preliminary washing of the wound, for washing may disperse organisms into the remote nooks and crannies of the wound. A different set of instruments should

3. Moore, A. E.: The Treatment of Postoperative Pulmonary Atelectasis, *Surgery* 5: 420-435 (March) 1939.

be used for débridement of the deeper portions of the wound. While the bacteriologic analysis of all the debrided tissue, in a manner such as described, invariably yields positive cultures, there may still be organisms left in the wound which are not represented in the debrided tissue. It has been found not infrequently that organisms develop infection in such wounds which were not originally found in the debrided tissue—even in cases which have been completely closed after débridement. I am sure that out of the war experience there will come a clearer knowledge of this important subject which Dr. Altemeier has called to our attention.

DR. DONALD MUNRO, Boston: The emphasis Dr. Evans lays on scalp wounds, his directions for diagnosing a compound fracture by palpation, the importance of making exploratory diagnostic trephinations not only in the temporal areas but in the occipital and perhaps cerebellar regions as well and his advice to the general surgeon to leave such technical specialties as the débridement of the brain to the trained neurosurgeon are all valuable points. I am sorry that he did not devote more space to the diagnosis and treatment of the nonoperable group of cerebral injuries. Except in actual combat these make up about two thirds of all craniocerebral injuries. He might have sacrificed his discussion about the much debated cause of concussion. This is the more true because recently (October 1943) and within six months of the presentation of Evans's paper new evidence on this subject has been presented from Oxford, England. This strongly suggests that acceleration and deceleration do not cause this pathologic entity. Instead it is stated that sheer strains set up by the different effects of rotational forces on the skull and brain are the etiologic factors regardless of forward or arrested movement of the head. I agree with Dr. Evans's definitions of the nonoperable cerebral injuries and in particular wish to draw attention to his definition of concussion. I think that there is some lack of logic in the description of the treatment that is recommended. This failure to class cerebral edema as a condition meriting more than incidental attention does not justify the evident care and thought he has given to its treatment. Furthermore, though he recognizes the pathologic importance and possible malign influence of increased intracranial pressure he neglects to include in his therapy measures looking toward its correction and, indeed, refers to lumbar puncture and its therapeutic effect in such a way as to create the impression that he does not advocate its use. This, together with his doubts as to the effectiveness of dehydration therapy by hypertonic solutions, leaves one wondering just what active treatment is to be used in these cases. I am sure that he knows that the treatment not only of contusion but also of edema and laceration of the brain has had for a number of years a solid factual foundation. I am sure that depressed fractures which overlie large vascular channels should, if possible, be left alone. They are not a fracture of which it is "particularly true" that elevation is required. Fatal hemorrhage with or without air embolus is too common a complication, especially when the operation is performed by the occasional neurosurgeon who fails to recognize the vital importance of curing the associated cerebral injury first. Nor do I feel that the therapy of compound fractures is as simple as is indicated here. It has been proved pathologically by Leary and Edwards that the arachnoid contributes no cells to the formation of the fibrous capsule that grows around a solid subdural hematoma. They are derived entirely from the dura. I am not aware that fluid is present in the normal cerebral subdural space. What is of importance, however, is the author's statements that "it is usually from such vessels as these (the larger cortical bridging veins) that subdural accumulations of blood occur" and "that sometimes they (such subdural collections) are secondary to laceration of the brain." These statements have been shown to have no basis in fact and are mere repetitions of earlier statements that were originally made on inadequate evidence. Recent detailed study of 310 cerebral and cerebellar subdural hemorrhages of all kinds and ages has demonstrated that the recognition of a ruptured bridging vein as the source of a subdural clot is so rare and so difficult as to make this a negligible consideration in the discussion of the

etiology of this condition. On the other hand, two thirds of these patients had hematomas which were proved to have originated with a contused or lacerated brain. I have had 1 and probably 2 patients die as the result of recurrent extradural clots that arose from a torn middle meningeal artery the proximal end of which had previously been "closed" at operation by the electrocautery. I am sure that the electrocautery should never be used for the purpose of closing the bleeding stump of a ruptured artery.

DR. MAX M. STRUMIA, Bryn Mawr, Pa.: Dr. Hoxworth has rightly emphasized the necessity for supportive treatment of wounded persons beyond the immediate needs of fluid replacement therapy designed to combat shock. In estimating the requirements of a wounded patient for plasma in particular and for proteins in general, the previous state of nutrition is an important factor. Preexisting hypoproteinemia greatly alters the requirements and, if severe, may defeat the therapeutic efforts unless large doses of the material are employed. Proper emphasis has also been placed on the prevention of shock in the presence of conditions likely to act as initiating elements. The routine administration of 5 per cent dextrose in isotonic solution of sodium chloride to patients in shock before plasma or blood is given does not appear justified. Particularly objectionable is the recommendation that it be given fairly rapidly. It is desirable to utilize the time required to make plasma available (less than one-half hour) in starting the venoclysis with saline-dextrose solution, but this should be administered at the slowest possible rate, just enough to maintain the needle open. Even 500 cc. of saline solution administered in ten minutes may be an excessive amount for a patient in or near shock, as it will increase rapidly the blood volume and consequently the filtration pressure, at the same time lowering the oncotic pressure. Under these conditions plasma protein losses are likely to be increased, particularly in the damaged tissues. I prefer estimating hemodilution and hemoconcentration by the variations in the hemoglobin content rather than by the hematocrit. The hematocrit determination is generally more difficult to obtain, requires the use of a centrifuge, at least one-half hour time and, unless skilful operators carry it out, offers a greater opportunity of error. A determination of the hemoglobin content is, on the other hand, readily done in a few minutes and, unless a blood dyscrasia exists, the figures obtained may be readily translated in hematocrit values. In addition, satisfactory apparatus for the determination of hemoglobin is usually at hand in all laboratories. After using for over one year the Kagan apparatus for the determination of plasma protein, employing the falling drop principle, I have abandoned it and given the preference to the biuret method. While the former method requires less technical skill, it is more subject to uncontrollable variations, whereas the latter method is more accurate and, above all, more dependable. Only parenteral administration of fluid is mentioned. It might be well to remember that if water can be taken by mouth it should be so administered not only because it is safer, simpler and cheaper but also because it is more pleasant to take.

DR. WILLIAM DEW. ANDRUS, New York: If the patient is in severe shock but has survived the injury for an hour or more, a short delay in order to treat the shock may make the patient better able to survive operation. The dictum that unless penetration can be ruled out, and this is extremely difficult, operation is definitely indicated is one of the most important in dealing with such patients. When one considers the area of the peritoneum and the extent of the contamination which commonly occur in such wounds, the powers possessed by this membrane of overcoming infection are all the more striking. This power exists, however, only when the source of infection is cut off or removed. Thus, when all the perforations of the bowel are closed, the chief consideration in removing intestinal content is how much can be done with a minimum of trauma. The methods suggested, i. e. aspiration and removal of only such material as can be done with minimal trauma to the peritoneum, usually suffice. I have had the opportunity of repeating exploration on 2 patients on whom I had operated for gunshot wounds of the abdomen. At the time of the first laparotomy there was

the grossest contamination of the entire peritoneal cavity, which contained not only blood and feces but several kinds of food particles which had been ingested an hour previously. No attempt was made to remove anything from the peritoneal cavity, the operation consisting solely in closing the holes in the stomach and small and large bowel. Both patients recovered without complications, and, at the second laparotomy a year later, except for a few filmy adhesions the peritoneum was everywhere smooth and glistening, striking evidence of its recuperative powers. Like Dr. Zininger, I have almost never inserted drains in such cases, using through and through sutures of silver wire to close the incision. Wounds of the pancreas introduce a further complication, however, and here the insertion of one or two cigaret drains through the gastrocolic omentum for a day or longer, if drainage is copious, may provide an additional factor of safety. I am particularly glad that Dr. Zininger has stressed the use of intratracheal anesthesia, since in these cases, in which operation must often be carried out while the patient's stomach contains considerable amounts of food and vomiting is almost the rule, it is important to be able to keep the respiratory tract free by means of suction if necessary. After operation continued vigilance may often discover atelectasis early when the use of appropriate measures can usually clear it up and avoid or minimize the subsequent progress toward consolidation. The decreased mortality rate mentioned by Dr. Zininger as due to improvements in anesthesia, adequate blood replacement, decompression of the bowel and chemotherapy, if maintained, will constitute a very considerable advance over the results of treatment of such wounds in the last world war.

DR. W. A. ALTEMEIER, Cincinnati: One of the most important factors influencing the development of infection is the treatment received by the wounded patient. I wish to emphasize again that the successful treatment of wounds is dependent primarily on the fulfillment of the fundamental principles of surgical treatment.

DR. JOSEPH P. EVANS, Cincinnati: I devoted special attention in my paper to the question of cerebral concussion because the work of Denny-Brown and Russell has offered for the first time a satisfactory experimental explanation of the phenomenon of concussion. The Oxford paper to which Dr. Munro refers no doubt that of Holbourn (*Lancet* 2:438 [Oct. 9] 1943), "which does not 'strongly suggest that acceleration and deceleration do not cause this pathologic entity' but rather offers a refinement of the original contention, for Holbourn points out that the production of sheer strains by rotational movements of the brain are apparently of considerable importance in the production of concussion. Rotation of the brain manifestly dependent requires acceleration or deceleration for its production. Dr. Munro is critical of my lack of enthusiasm for spinal drainage and for the use of hypertonic solutions in the treatment of cerebral edema and contusion. I have yet to be convinced that these forms of 'active treatment' materially improve the patient's chances for recovery of physical and mental well-being. Until more fundamental investigative work is carried out on the physical and chemical alterations occurring in the brain in cases of head injuries, we shall continue to judge our results on a purely empirical basis, each advocate of a particular method serving as his own judge. I think his emphasis on the dangers of elevating a depressed fracture lying over a large sinus is proper. Such cases are better not undertaken by the occasional neurosurgeon, and in some instances may better be left alone. The statement that a small amount of fluid is normally present in the subdural space is based on experimental work on dogs done by Penfield (*Am. J. Dis. Child.* 26:383 [Oct.] 1923; *Anal. Rec.* 28:173, 1924), who froze the intact skull, cut it serially and demonstrated the presence of small numbers of frozen yellowish crystals which on analysis proved to have a high protein content. The same experiment has not been done on man, but it seems a fair presumption that similar small amounts of fluid exist there. Munro and I are in agreement concerning the formation of the subdural hematoma capsule from dural rather than arachnoidal elements. Dr. Munro and I are far from being in accord as to the source of the bleeding in cases of subdural hematoma. He challenges my

statement that "it is usually from such vessels as these (the larger cortical bridging veins) that subdural accumulations of blood occur," and he goes on to say "These statements have been shown to have no basis of fact and are mere repetition of earlier statements that were originally made on inadequate evidence." This represents, I believe, a change in the Boston City Hospital point of view. Thus, Leary (*THE JOURNAL*, Sept. 22, 1934, p. 897) wrote, concerning the source of the hemorrhage: "It is evident that hemorrhage in the subdural space can arise from the rupture of vessels anywhere in the structures abutting on or lining the cavity. . . . In skull fractures, laceration and contusion of the brain is the usual source. . . . In cases unassociated with fracture of the skull or evident brain damage, it is impossible to determine the source of the hemorrhage if time enough has elapsed to obscure or heal the bleeding vessel. In the cases accompanied by rapid death in which the blood is found still fluid at autopsy, a search for the source is more fruitful. In 8 cases I have been able to find the bleeder, which in 5 cases was a torn bridging vein and in 3 cases a vein at the surface of the arachnoid." While 12 of the 50 cases studied by Leary were not proved to have been due to trauma, only 2 were obviously due to other causes. I believe that in some instances blood is poured into the subdural space from contused or lacerated brain tissue, but I was surprised to learn that of 310 cases studied by Dr. Munro two thirds presented hematomas which were proved to have originated with a contused or lacerated brain. My own experience fails to coincide with these conclusions. For six years the neurologists and neurosurgeons at the Cincinnati General Hospital have cut brains once a week, including practically all the cases of head injury coming to autopsy at that hospital. While we do not have figures to bear out our contention, neither Dr. Charles Aring nor I, nor Dr. Mark Scheinker, who for the past two years has served as the neuropathologist in our unit, believes that the incidence of subdural hemorrhage dependent on cerebral contusion or laceration is anything like so high as suggested by Dr. Munro. However, that is a point which future work will have to elucidate. Dr. Munro's contention that the electrocautery should never be used for the purpose of closing the bleeding stump of a ruptured artery is no doubt a sound one. In view of the back bleeding that may occur from anastomotic vessels, I believe it would be sound to advise not only the mechanical rather than thermal closure of the middle meningeal vessel at the foramen spinosum but the additional safeguard of coagulating any other bleeding points which may tend to persist following the closure of the main stem of the vessel in the manner suggested by Dr. Munro.

DR. PAUL IRWIN HOXWORTH, Cincinnati: Dr. Strumia objects to rapid administration of dextrose and saline solution to patients in shock as a preliminary to plasma transfusion. Most experimental evidence clearly supports the reasons he supplies for his objections. Nevertheless, in practice, almost uniformly one sees immediate improvement in the patient after such administration. While we know this to be only a transient improvement in most instances unless followed by plasma or blood, it is gratifying and, if followed immediately by adequate amounts of plasma, any improvement gained is generally maintained. Amounts of electrolyte solutions up to 500 cc. are probably utilized rapidly by the patient after plasma transfusion is begun. The initial intravenous injection in these cases should be made with plasma, but this is difficult in actual practice. The choice of laboratory methods for estimating hemodilution, hemocentration and plasma or serum protein content must depend not only on the method but on the technician's skill, his acquaintance with the method and the facilities available for performing the test. Parenteral routes were devised only as substitutes for enteral routes for fluids. Oral administrations should be reestablished as early as it is practicable. Even if fluids can be taken by mouth, they should be withheld routinely in the management of wounded persons, however, until it is made certain that general anesthesia is not to be employed early.

DR. W. E. ADAMS, Chicago: Injuries of the chest accounted for 20 to 30 per cent of the dead picked up on the battlefield in World War I. The early mortality of those escaping immediate death was approximately 25 per cent. This explains why

only 4 to 8 per cent of the wounded admitted to the clearing stations were because of this lesion. Unless these cases receive early adequate management the mortality will be especially high. One of the chief factors responsible for the high death rate in this injury is internal hemorrhage from wounds of the heart, one of the great vessels or vessels of the chest wall. A second important factor is the disturbance of cardiorespiratory function by alteration of intrathoracic pressures. Either of these conditions, unless quickly remedied, may lead to an early death. The principles which Dr. McGrath has outlined for treatment, when followed, will save many lives. The important fact is that this management must be carried out early and continuously, for the condition of these patients may change from one ten minute period to another. Therefore they must be followed almost constantly until their condition is stabilized. One type of injury that has been mentioned frequently in reports of casualties of World War II might receive additional emphasis, namely the "stove-in" chest wall. In this injury a portion of the chest wall becomes mobilized by virtue of several ribs having been fractured at two sites by a crushing blow. Thus with each respiratory effort this portion of the chest wall moves inward and outward. With this action the efficiency of the respiratory effort is reduced in a way that is similar to that seen in large open sucking wounds of the chest wall. Emergency management entails the stabilization of this portion of the chest wall by adhesive strapping until adequate management can be obtained.

DR. M. M. ZINNINGER, Cincinnati: The only additional comment I wish to make is that the mortality rate at the Cincinnati General Hospital has remained fairly stationary. Since the paper was written a number of additional cases have been studied. The series at present consists of 71 cases with 8 deaths, a mortality rate of approximately 11 per cent.

GALLSTONES

HOW FAR MAY WE GO IN POSTPONING OPERATION?

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To what extent may we expect delay in surgical intervention to contribute to complications in gallstones? This question, pertaining to approximately 10 per cent of the population,¹ is particularly pertinent at this time. Before World War II patients could be operated on promptly and at will even for symptomless gallstones. Today patients cannot be so favored. The improved economic status of the public and the popularity of group hospitalization insurance have created an unprecedented demand on hospitals for private accommodations. Hospital beds and nursing services must be conserved. Over 36,000 nurses have already gone into the armed services, and the Red Cross has agreed to recruit an equal number by June 30, 1944.² Moreover, there is greater validity today in the patient's argument that he or she cannot surrender present duties and responsibilities of an essential occupation or of a household without help. As a result, operations for gallstones without biliary complications, even if giving rise to troublesome symptoms, may have to be postponed.

In an attempt to evaluate the probable effects of deferment of operation in cholelithiasis, an analysis was made of 253 consecutive private cases of operation for gallstones. The patients were all white between the ages of 14 and 77. The average duration of symptoms

for the series was 5.1 years, as shown in the accompanying table. One hundred and fifty-three (61 per cent of the series) had symptoms attributable only and directly to the cholelithiasis; the average duration of these symptoms was 4.6 years. The remaining 100 (39 per cent of the series) had the following complications: acute cholecystitis, common duct stones, acute pancreatitis, carcinoma of the gallbladder and diabetes.

Average Duration of Symptoms of Gallstones Before Operation

(1) 253 cases	5.1 years
(2) 153 cases without biliary complications...	4.6 years
(3) 100 cases with biliary complications.....	6.7 years *
Acute cholecystitis	4.9 years
Acute pancreatitis	3.9 years
Choledocholithiasis	5.6 years
*Diabetes	9.6 years
*Carcinoma of the gallbladder.....	21.3 years

* Excluding diabetes and carcinoma, the average duration of cases with biliary complication was six years.

The average duration of symptoms in this group was 6.7 years, or 2.1 years longer than for those without complications.

Acute cholecystitis, including empyema, gangrene and perforation of the gallbladder was encountered in 68 patients (27 per cent of the series). The average duration of symptoms in these cases was 4.9 years, or four months longer than in those without complications. Approximately one third of these 68 patients, however, developed acute inflammation within one year of the onset of symptoms; in fact, the first evidence of gallstones in 5 of these patients was an attack of acute cholecystitis.

Acute pancreatitis was found in 10 patients (4 per cent of the 253), 6 having edema of the pancreas and 4 having acute hemorrhagic pancreatitis with fat necrosis. The average duration of symptoms was 3.9 years, or eight months less than the average for the uncomplicated cases. Five had symptoms for less than one year, and 2 had but one attack. Acute pancreatitis, therefore, like acute cholecystitis, may occur either early or late in the presence of gallstones and may even be the first evidence of biliary calculi.

Stones in the common duct were removed in 30 cases (12 per cent of the 253), in 3 of which there were no stones in the gallbladder. Acute pancreatitis also was present in 2 of this group, acute cholecystitis in 9 and carcinoma of the gallbladder in 2. Although the average duration of symptoms for the common duct cases is about one year longer than in the uncomplicated cases, there were attacks for less than one year in 9 cases (30 per cent of the 30), including 3 in which but one attack occurred.

Five patients (2 per cent of the 253) had concomitant diabetes. All were over 40, and the average duration of symptoms was 9.6 years, or five years longer than the average for uncomplicated cases. It has been stated that the incidence of complications of gallbladder disease "is considerably greater in the diabetic than in the nondiabetic."³ One of these diabetic patients developed acute cholecystitis after having had symptoms of gallstones for eighteen years, and another after four years of biliary symptoms came to operation with acute cholecystitis, common duct stones and acute pancreatitis. Whether the existence of gallstones is a

1. Warren, Richard, and Balch, F. G., Jr.: Carcinoma of the Gallbladder, *Surgery* 7: 657 (May) 1940.

2. Wartime Nursing Is Different, *J. A. M. A.* 123: 99 (Sept. 11) 1943.

3. Eisele, Harold E.: Results of Gallbladder Surgery in Diabetes Mellitus, *Ann. Surg.* 118: 107 (July) 1943.

factor in initiating or aggravating diabetes is a question.⁴ It has been conclusively shown,⁵ however, that the severity of a concomitant diabetes is not diminished by a cholecystectomy.

Three patients (1 per cent of the 253) had carcinoma of the gallbladder. Biliary symptoms were present before operation for periods of six, twenty-seven and forty years. Two of these patients also had common duct stones; they lived three and one-half months and two and one-half years, respectively, after operation. The third patient, aged 77, who presented extensive metastasis, died on the seventh postoperative day. Although there is no unanimity of opinion whether gallstones most commonly precede or follow carcinoma of the gallbladder, the weight of evidence favors the latter. The duration of symptoms in carcinoma of the gallbladder has been reported as varying from less than one month¹ to thirty years.⁵ Since cancer of the gallbladder is found in only 1 per cent to 2.5 per cent of patients operated on for gallstones,¹ cancer as the result of postponement of operation for gallstones must be held to be only a remote possibility.

In addition to the death just recorded, there were 15 others in the series of 253 patients. Twelve patients—4 with biliary complication and 8 without—died from causes entirely unrelated to the biliary pathologic condition, namely pulmonary embolism, coronary occlusion, acute cardiac dilatation, wound rupture and evisceration, peritonitis and bronchopneumonia, any of which may follow an abdominal operation.

The remaining 3 fatalities were the only ones in the series in which death can be directly attributed to delay in surgical intervention. They were all in the group with biliary complications. The first patient was not seen until two and one-half days after the onset of the first and only attack of abdominal pain. At operation six hours later an open acute perforation of the gallbladder was found. Hemolytic streptococcal infection caused death on the seventh postoperative day. The second patient had had a cholecystectomy three years previously for acute cholecystitis and cholelithiasis. Symptoms recurred two and one-half years after operation and continued for six months before surgery was permitted. The patient came to operation in poor condition, with jaundice and clay colored stools. The common duct was found to be packed with stones. Urinary suppression developed after operation, and death occurred on the third postoperative day. The third patient had symptoms for two years before operation, recently increasing in severity. Surgery was accepted seven months after it was advised. The patient was jaundiced, with clay colored stools. Operation revealed empyema and gangrene of the gallbladder, suppurative cholelithiasis and several common duct stones. Death eleven days after operation resulted from septic peritonitis.

As desirable as it may be to operate for gallstones "before the development of advanced pathological conditions of the bile ducts, the liver, the pancreas and the vital organs,"⁶ it is not always possible. The ideal time to operate, of course, is before the patient has symptoms, but "silent stones" are found only incidentally at an x-ray examination or a laparotomy for

some other condition. Patients are not generally seen by the surgeon until the symptoms have become severe enough to warrant the consideration of operative treatment. The longer the duration of symptoms before operation, the greater the likelihood of biliary complications, but how early these complications will arise in any individual case cannot be predicted. One analysis⁷ shows an increase of common duct stones from 1.9 per cent in patients with symptoms for less than two years to .16 per cent for those with symptoms from ten to thirty-five years. On the other hand, another report⁸ states that 46 per cent of patients with common duct stones gave a history of symptoms going back less than one year. In the present study approximately one third of those with common duct stones, one third of those with acute cholecystitis and one half of those with acute pancreatitis stated that their symptoms had existed less than one year. Moreover, complicating pathologic changes in the biliary tract may be present with the initial symptoms of gallstones; in this series 20 per cent of the patients with acute pancreatitis, 7 per cent of those with acute cholecystitis and 10 per cent with common duct stones had these complications with their first attack of abdominal pain. Some patients, however, have symptoms of gallstones for a protracted period and yet develop no complicating biliary pathologic condition. Of this series of 253 patients, 61 per cent had no biliary complications although they had symptoms averaging 4.6 years (one having reported attacks over a period of thirty-nine years).

SUMMARY AND CONCLUSIONS

It is evident that biliary complications may occur at any time in the presence of cholelithiasis. They may be present when the patient is first seen or they may not occur at all even when there are frequent attacks of colic over a long period of years. The presence of complications adds to the risk of operation and calls for prompt treatment. Early operation is likewise desirable for cholelithiasis without complications, since delay increases the likelihood of their occurrence. Operation, however, may be safely deferred in patients with gallstones so long as there is no evidence of complications and provided postponement is not so protracted that it may impair the patient's resistance to the operative procedure.

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7. Heyd, C. G.: Gallbladder Disease: Consideration of Mortality. *New York State J. Med.* **41**: 1183 (June 1) 1941.

8. Lahey, F. H., and Swinton, Neil: Stones in the Common and Hepatic Bile Ducts, *New England J. Med.* **213**: 1275 (Dec. 26) 1935.

Involutional Melancholia.—Strecker suggests that human beings, like nations, have epochs in their lives during which they are exposed to serious hazards, incidental and epochal. At the epoch of the climacteric there are peculiar dangers and risks, both somatic and psychological. It is here that the period of regression may begin. The climacteric for men, as well as women, is an epoch of insecurity with a triple threat: somatic, environmental and the inner psychic turmoil. The sex ratio for involutional melancholia is about three women to one man. The age range in women is about 40 (or earlier if there has been an artificial menopause) to about 55. In men it extends from 50 to 65. Often the step from climacteric to psychosis seems rather short. The depression which occurs is as deep as, or deeper than, the depressive phase of manic-depressive psychosis; the self accusation is more pronounced and the suicidal trends more acute.—Davis, John E.: *Principles and Practice of Rehabilitation*, New York, A. S. Barnes & Co., Inc., 1943.

4. Joslin, E. P.: Relation of Trauma to Diabetes, *Rocky Mountain Law Rev.* **15**: 173 (June) 1943.

5. Magoun, J. A. H., and Renshaw, Kinsley: Malignant Neoplasia in the Gallbladder, *Ann. Surg.* **74**: 700 (Dec.) 1921. Warren and Balch.¹

6. The Surgical Treatment of Gallstone Disease, editorial, *J. A. M. A.* **104**: 836 (March 9) 1935.

THE PRODUCTION BY MODERATE
EXERCISE OF A HIGH INCIDENCE OF BENDS

AT ALTITUDES OF 26,000 TO 28,000 FEET

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It has generally been supposed that the bends and the chokes¹ occur infrequently or not at all at altitudes under 30,000 feet. According to Armstrong,² "With ascents at rates as high as 12,000 feet per minute up to 30,000 feet, symptoms are seldom noted even after prolonged stays at that altitude." The present report is concerned with demonstrating that this need not be the case and that under appropriate conditions bends equaling in incidence and severity those reported at altitudes above 30,000 feet may be produced in the low pressure chamber at altitudes as low as 26,000 feet.

SUBJECTS

Subjects participating in these experiments were all volunteers from this unit. It is believed that they represent a fair cross section of Air Corps enlisted personnel. All had passed the required modified "64 examination." Only one of these men was on limited service, and this because of defective vision. Thirteen were below the age of 30, the average age being 23. Five were 30 years old or over, the highest age being 34, the average being 32. The two officers were 30 and 36 years old. Sixteen of the 19 enlisted men had participated in high school or college athletics, 10 in baseball, 9 in football, 5 in basketball, 2 in track and 2 in boxing. The physical condition of the personnel of this unit was good by virtue of one or two hours of calisthenics and athletics a day. This is reflected in their average physical fitness rating of 47.5. A variety of physical types was represented in this group, as shown by height and weight measurements included in table 2.

With the exception of the officers, these men had not experienced nor had they seen bends and chokes prior to the chamber flights. There is no reason to believe that any prejudice existed as to the results or that psychic factors played an important or significant role. The average general classification score of the enlisted men was 108.

PROCEDURE

The oxygen masks used were the A-10 type and showed less than a 3 per cent leak according to the Scholander test. Before each chamber run the fit of the masks was checked by the "sniff" test. Pulse and blood pressure were checked at the start of each flight and again immediately after descent. At least two days elapsed between flights for any 1 person, and if bends had developed at least four days and usually more

intervened between the flights. The majority of flights were started at 8 a. m., but 4 were started at 1 p. m. The chamber temperature for the flights varied between 68 and 88 F.

Pressure altitude was used throughout as indicated by three altimeters with Kollsman settings of 29.92. These altimeters agreed at the altitudes employed within 100 feet. With the exception of the first two flights the altimeters were covered so that the men in the chamber were unaware of their simulated altitude. The rate of ascent was 3,000 feet per minute except in one control flight. In the basic experimental flights the mask was connected to the regulator at 18,000 feet with the automix³ set in the "off" position in an attempt to delay denitrogenation⁴ during ascent and to accelerate it at altitude. Only slight symptoms of anoxia were produced in the ascent to 18,000 feet. On reaching the desired altitude each man did five deep knee bends and extended five times at arm's length a 14 pound high pressure oxygen cylinder held on the palms.

TABLE 1.—Flight Conditions and Occurrence of Bends at Simulated Altitudes of 26,000 to 28,000 Feet

Flight	Altitude, Ft.	Mask Plugged In, Ft.	Automix Setting ^a	Exercise	No. of Men	Grade 3 Bends ^b		Grade 2 Bends ^c	
						No.	%	No.	%
1 Ex.	28,000	18,000	Off	Yes	19	6	32	2	11
2 C.	28,000	10,000	On	No	17	1	6	0	0
3 Ex.	28,000	18,000	Off	Yes	17	7 ^d	41	2	12
4 Ex.	27,000	18,000	Off	Yes	15	5 ^e	33	2	13
5 C.	14,000	9,000	Off	Yes	17	0	0	0	0
6 Ex.	26,000	18,000	Off	Yes	14	3	21	2	14
7 Ex.	25,000	18,000	Off	Yes	17	0	0	0	0
8 Ex.	28,000	18,000	Off	No	17	0	0	2	12
9 Ex.	28,000	10,000	On	Yes	18	5	28	1	6

a. Automix "off" gives 100 per cent oxygen at all altitudes; automix "on" gives the appropriate mixture of air and oxygen at all altitudes.

b. Necessitating descent.

c. Descent not necessary.

d. Includes 1 case of grade 4 chokes.

e. Includes 1 case of grade 3 chokes.

These two exercises were repeated every ten minutes during the flight. In the majority of the cases two hours were spent at altitude; however, in three flights it was necessary to cut the time short to avoid interference with the indoctrination activities of the unit. The shortest time spent at altitude was one hour.

RESULTS

The typical symptoms of bends and chokes encountered were graded in accordance with the procedure employed at S. A. M., Randolph Field, Texas. Thus, grade 1 indicates transitory symptoms, grade 2 intermittent or continuous symptoms not requiring descent, grade 3 symptoms necessitating descent and grade 4 symptoms accompanied by general symptoms such as nausea, sweating or fall in blood pressure.

The order in which the flights were performed and the incidence of grade 3 and grade 2 bends are shown in table 1. Only 1 case of bends was encountered in the control flight to 28,000 feet (automix on at 10,000 feet, no exercise). No symptoms occurred in flight 5, which simulated the experimental flight to 28,000 feet except

3. Automix "off" gives 100 per cent oxygen at all altitudes; automix "on" gives the appropriate mixture of air and oxygen at all altitudes.

4. The elimination of nitrogen from the body by the reduction of the partial pressure of this gas either by increasing the altitude or by increasing the partial pressure of oxygen.

From the 16th Altitude Training Unit, Greenville Army Air Base, Greenville, S. C.

Lieut. Col. Frank J. Shaffer, M. C., A. U. S., base surgeon, Greenville Army Air Base, Greenville, S. C., gave help and encouragement.

1. By bends and chokes are meant the pains produced in the long bones and lungs, respectively, as the result of decompression. These and other symptoms are presumably due to the formation of nitrogen bubbles.

2. Armstrong, H. G.: Principles and Practice of Aviation Medicine. Baltimore, Williams & Wilkins Company, 1939, p. 350.

that rate of ascent and altitude were cut in half. It would appear that these two flights eliminate suggestion or a desire to cooperate as factors in the experimental flights. A further check on these factors is provided by flight 7 to 25,000 feet. At this altitude the incidence of bends was zero, but at 26,000 feet 21 per cent of grade 3 bends and 14 per cent of grade 2 bends occurred. At 27,000 feet and 28,000 feet grade 3 bends were encountered in from 32 to 41 per cent of the men. At these altitudes 35 per cent of grade 3 bends were produced in fifty-one man flights. This high percentage for two hour flights may be partially due to premature descents with discomfort that could have been tolerated for the duration of the flight. In the opinion of the observers there was little evidence to substantiate this supposition. In any case the frequency of grade 3

TABLE 2.—Individual Susceptibility to Bends at Simulated Altitudes of 26,000 to 28,000 Feet

Flight No.		1		3		4		6		9	
Altitude, feet.....		26,000		26,000		27,000		26,000		28,000	
Name	Age	Height		Weight	P. F. R. ^a	Grade 3 Bends ^b	Grade 2 Bends	Grade 3 Bends	Grade 2 Bends	Grade 3 Bends	Grade 2 Bends
		Ft.	In.								
Huffstetler	24	5	8½	150	51	3	..	3	3	3	3
Krahe.....	20	6	1	170	43	3	3	3	..	3	3
Wolk.....	23	6	1	176	46	3	3	..	3	3	3
Callahan...	20	5	11	210	46	3	3	0	3	0	0
Dunn.....	22	5	9½	195	50	3	3	Ch. 3	0	0	0
Lundeen...	23	5	10½	158	45	0	3	2	0	3	3
Climperman	25	5	11½	185	49	0	3	0	0	3	3
Riesen.....	30	5	10½	150	58	2	..	3	2	2	2
Bradley....	21	5	10½	135	54	3	0	0	0	0	0
Illigan...	31	5	10	170	48	0	0	3	..	0	0
es.....	33	5	0	155	40	0	Ch. 4	..	0	0	0
rkas....	27	5	10½	185	55	2	2	0	0	0	0
Gardner....	26	5	7½	165	35	0	2	0	2	0	0
Crocker....	34	5	6½	165	54	0	0	0	..	0	0
Eastburn..	31	6	1	200	36	0	0	..	0	0	0
Lazazzero..	23	5	8½	150	50	0	..	0	0	0	0
Merrill....	20	5	11½	150	46	0	0	..	..	0	0
Robinson..	32	5	8	158	46	0	0	0	0	0	0

a. Physical fitness rating. Good, 47 to 63; poor, 31 to 46.

b. Grade 3 bends = pain necessitating descent; grade 2 bends = descent unnecessary.

bends would hardly have been less than 20 per cent. There were 2 cases of chokes, which are included under grade 3 bends in table 1. These will be described in case histories.

The average time after reaching altitude to the appearance of the first symptoms that subsequently gave rise to grade 3 bends was forty-seven minutes. On the average the intensity of the pain was sufficient in ten minutes to indicate descent. This time varied from two minutes to one-half hour. The subjective symptoms of bends disappeared during descent at altitudes varying from 15,000 to 24,000 feet, with an average of 18,500 feet. The average chamber temperature at the time of the occurrence of grade 3 bends was 72 F. (from 67 to 88 F.).

The pain produced at altitudes above 25,000 feet was of the deep, sickening variety and in grade 3 bends was frequently associated with a loss of use of the affected members. Confined almost entirely to the joints of the long bones, the distribution of the subjective symptoms

of grade 2 and 3 bends was knee 35, shoulder 7, wrist and hand 5, ankle 4, elbow 2, shin bone 2, hip joints 1 and upper arm 1.

Fourteen cases of skin sensations were reported by a total of 10 subjects. All but 2 of these cases were at 28,000 feet. Five were associated with the bends. The sensations were cold 6, heat 6, tingling 4, itching 2 and formication 2.

It is of interest to note that crepitation without pain occurred in the little finger of one of the officers at 28,000 feet. The gas bubbles were easily felt by another officer and 2 enlisted men.

Following the production of bends at 26,000 feet, attention was turned to the factors responsible for their occurrence. Runs were made at 28,000 feet first with denitrogenation delayed (mask plugged in with the automix in the "off" position at 18,000 feet) but without exercise; and, second, with the normal use of oxygen (mask plugged in with the automix in the "on" position at 10,000 feet) plus exercise. The results shown in table 1, flights 8 and 9, indicate that exercise was the primary cause of bends at 28,000 feet, the incidence of grade 3 bends being 28 per cent. The delayed denitrogenation alone produced no grade 3 bends and 12 per cent grade 2 bends. Whether or not the latter procedure increased the incidence of bends produced by exercise cannot be determined from the limited data available. Certainly it was not a major factor.

Individual susceptibility to bends (and chokes) on four or five bends producing flights at simulated altitudes of 26,000 to 28,000 feet is shown in table 2. The men have been arranged in descending order of their susceptibility to grade 3 bends. Within a group showing the same frequency of grade 3 bends, those individuals who developed grade 2 bends in addition have been placed at the top of the group. Excluding grade 2 bends and considering only grade 3 bends and chokes, the subjects fall into five groups. Three men developed these symptoms in all four of their flights. Symptoms in 60 per cent of their flights were shown by 2 men, in 40 per cent by 2 men and in 20 to 25 per cent by 4 men. Seven men had no grade 3 bends or chokes in three to five flights. Two of these 7 men experienced grade 2 bends in 40 per cent of their flights.

Seventeen of the men listed in table 2 have been divided into three groups, depending on whether the incidence of stage 2 or 3 bends or chokes during their first two flights to 28,000 feet was 0, 1 or 2. The occurrence of symptoms for men in these groups on subsequent flights (table 1; flights 4, 6 and 9) has been presented in table 3. The symptoms on the basis of man flights equaled 9, 29 and 59 per cent, respectively. But 1 man having bends in both of his first two flights was symptom free in his next three tests. Grade 2 bends symptoms were included in these calculations to circumvent the possibility that some grade 3 bends were in reality of grade 2 intensity. Applying the same procedure to grade 3 bends and chokes alone, the percentage of apparently incapacitating symptoms for the three groups was 6, 15 and 67 per cent.

The results suggest that no pronounced correlation exists between body build (as measured by height and weight) or physical fitness, and susceptibility to bends in this group. However, there does appear to be an inverse correlation between age and susceptibility. This possible absence and presence of correlation was

not subjected to statistical analysis, since such tests would be of very dubious significance in view of the limited number of men run.

CASE HISTORIES

Three case histories, two of chokes and one of bends, will serve to illustrate the severity of these reactions at altitudes below 30,000 feet.

Cpl. Jones developed a substernal pain, accompanied by coughing, after ninety minutes at 28,000 feet. Although the coughing was not violent, Cpl. Jones was removed to the lock and brought to ground level at 3,000 feet per minute. During descent he was very pale and appeared to be in considerable discomfort primarily because of difficulty in breathing. On reaching ground level his sitting blood pressure was found to be 80/60 as compared to 120/70 before the flight. Deep inspiration produced a sharp substernal pain. While the blood pressure was being taken, Cpl. Jones became nauseated and broke out in perspiration. The pulse was 65 as compared to a preflight pulse of 72. He was immediately placed in shock position. Five minutes later the systolic pressure had risen to 90 and the pallor, sweating and nausea had disappeared. He was taken by ambulance to the hospital, some 3 miles away, where his prone blood pressure was found to be 95/65. The chest pain on deep inspiration had disappeared. The corporal was hospitalized for twenty-four hours. He felt weak and tired for the remainder of the day but by the next day had completely recovered.

After 113 minutes at 27,000 feet it was observed that Sgt. Dunn was having difficulty in breathing. He insisted that he felt no pain, but when told to take a deep inhalation a sharp substernal pain was experienced. Later he admitted that his chest had hurt for ten or fifteen minutes. Four minutes later he became very pale and the chamber was dropped despite his protest. At the same time he coughed several times and then went into violent and alarming paroxysms of coughing. At 20,000 feet he tore his oxygen mask off and resisted all attempts of the inside observer to replace it. Two masks with the regulator emergency turned on were held close to his face. He broke out in a heavy perspiration and gestured for something in which to vomit (pulse 90). However, he did not do so. All the while the coughing was so severe that the observers feared asphyxiation might ensue. At 10,000 feet the coughing and nausea subsided and the patient was stretched out on the chamber seat with his feet elevated. At ground level the blood pressure was 125/76 and the pulse 84 (preflight blood pressure 108/70 and pulse 72). The pain produced by deep inspiration disappeared after one hour, but the chest muscles were sore for the remainder of the day.

On an experimental flight to 25,000 feet Cpl. Cimperman descended after fifty-eight minutes without symptoms. After four minutes at ground level he ascended at a rate of 5,000 feet per minute. Ten minutes later he developed severe bends in the right knee and was forced to come down. This case has not been included in tables 1 or 2.

SUMMARY

1. Moderate exercise and delayed denitrogenation in a flight of two hours' duration at 28,000 feet produced bends and chokes necessitating descent in 36 per cent of the cases. These symptoms occurred in 33 per cent of the men tested at 27,000 feet, in 21 per cent at 26,000 feet and in 0 per cent at 25,000 feet.

2. At 28,000 feet grade 3 bends was produced in 28 per cent of the men by moderate exercise alone. Delayed denitrogenation alone produced no grade 3 bends at this altitude.

3. In five bends producing flights (eighty-three man flights) at simulated altitudes of 26,000 to 28,000 feet for two hours the incidence of grade 3 bends was 29 per cent, of grade 2 bends 11 per cent and of skin sensa-

tions 17 per cent. *Two cases of chokes, 1 accompanied by shock, occurred.

4. In 18 men making four or five bends producing flights the incidence of grade 3 bends or chokes ranged from 100 per cent in 3 men to none in 7.

5. In 17 men the occurrence or absence of bends (grade 2 or 3) and chokes on their first two flights was a good index of susceptibility or resistance to these symptoms on subsequent flights.

6. These results suggest that bends and chokes may occur in men required to perform moderate exercise in combat ships at altitudes as low as 26,000 feet.

ADDENDUM

Since the completion of this work, 9 of the men listed in table 3 have participated in indoctrination flights to altitudes of 26,000 to 30,000 feet. The rate of ascent was 3,000 feet per minute to an altitude of 18,000 feet, broken by a three minute stay at 10,000 feet, at which time the oxygen regulators were turned on and the oxygen masks applied. B. L. B. masks and constant

TABLE 3.—Predictive Value of Two 28,000 Foot Flights in Subsequent Flights at Altitudes of 26,000 to 28,000 Feet

Incidence of Bends ^a in First Two Flights to 28,000 Feet								
0			1			2		
Name	No. of Subsequent Flights	Incidence of Symptoms ^b	Name	No. of Subsequent Flights	Incidence of Symptoms	Name	No. of Subsequent Flights	Incidence of Symptoms
Crocker.....	2	0	Lundeen....	3	2	Huffstetler..	2	2
Eastburn...	2	0	Cimperman. 3	1		Krahe.....	2	2
Lazazzero...	2	0	Bradley....	3	0	Wolk.....	2	2
Robinson...	3	0	Jones.....	2	0	Riesen.....	2	2
Dulligan....	2	1	Gardner....	3	1	Callahan....	3	1
						Dunn.....	3	1
						Farkas.....	3	0
Total.....	11	1	Total.....	14	4	Total.....	17	10
Per cent bends....	9		Per cent bends....	29		Per cent bends....	59	

a. Grades 2 and 3 combined. b. Bends or chokes, grades 2, 3 or 4.

flow regulators were used. Consequently the oxygen flow was manually adjusted in accordance with the altitude. After five to ten minutes at 18,000 feet the chamber was raised at 1,000 feet per minute to the maximum altitude employed.

During these flights the men, who were acting as inside observers, performed no more exercise than is involved in giving a fifteen minute lecture while seated, and rising occasionally to turn on a regulator or adjust an oxygen mask. Nevertheless Dunn was seized with severe pains in his left shoulder after twenty-nine minutes at 26,000 feet. These pains were severe enough to necessitate descent. Bradley experienced grade 2 bends in the right elbow after five minutes at 28,000 feet and, although not incapacitating, the pain persisted until the flight was terminated fifty-eight minutes later. On the other hand Crocker, Lazazzero, Dulligan, Lundeen, Huffstetler, Callahan and Farkas (table 3) were symptom free in a total of eleven flights.

Also, since the completion of this work, it has come to our attention that other workers in this country and in Canada have observed bends as the result of exercise at altitudes well below 30,000 feet.

Clinical Notes, Suggestions and New Instruments

INFLUENZAL MENINGITIS IN BROTHERS

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Influenzal meningitis is generally considered to be a non-contagious sporadic disease of infants. The causative organism is *Haemophilus influenzae*, a gram negative bacillus described by Pfeiffer in 1892. Levinson¹ reports that from 79 to 80 per cent of cases occur in children under 2 years of age. The appearance of this disease in brothers aged 4 years and 2 years respectively, with an acute fulminating course and death within twenty-four hours of onset, is considered worthy of record as it emphasizes the potential contagious nature of influenzal meningitis. In a search of the literature the only other occurrence of the disease among siblings that we could find was that of a report by Davis² in 1909 in which he described influenzal meningitis in newborn twins. Both infants contracted the disease on the fifth day of life. One twin died on the ninth day of life and the other on the twelfth day. The mother was in good health, and no source of infection was found.

REPORT OF CASES

CASE 1.—D. M., a boy aged 4 years, had previously enjoyed good health except for a recent mild upper respiratory infection that his mother described as a mild head cold. On Sept. 26, 1943 he attended Sunday school in the morning. That afternoon he complained of not feeling well. His temperature was found to be 102 F., pulse rate 130 and respiratory rate 50. There were convulsive movements of the face and upper extremities with pronounced rigidity of the neck and spinal column. Kernig's sign was questionably positive. The mucous membranes of the throat appeared normal. There was questionable redness of the left ear drum. The remaining examination showed nothing of note. Hemoglobin was 71 per cent (Sahli).¹ The leukocyte count was 5,550 with 78 per cent neutrophils and 2 per cent lymphocytes. A spinal puncture showed a cloudy fluid with 3,260 cells. A differential count showed 93 per cent neutrophils and 7 per cent lymphocytes. A gram stain on the spinal fluid showed large numbers of pleomorphic gram negative bacilli. The spinal fluid sugar was less than 15 mg. per hundred cubic centimeters. The organisms would not grow on plain mediums. On chocolate blood agar and other enriched mediums they showed small translucent colonies. The bacteriologic diagnosis was *Haemophilus influenzae*. A specimen of spinal fluid was submitted to the Minnesota Department of Health, Division of Preventable Diseases. The report was as follows: "The fluid was clear on receipt. The Nonne test showed the presence of globulin. Direct smears showed many polymorphonuclear leukocytes and pleomorphic gram negative rods, which showed capsular swelling with *Haemophilus influenzae*, type B antisera. Cultures show gram negative pleomorphic bacilli which grow only on blood enriched mediums and give a capsular swelling with *Haemophilus influenzae*, type B antisera." The patient was started on sulfadiazine both orally and subcutaneously. He suffered from projectile vomiting. He grew progressively worse. The temperature at 12 p. m. was 103 F. He became cyanotic and had generalized convulsions. The child died at 2:50 p. m. on September 27, six hours and forty minutes after admission to the hospital and approximately twenty-six hours after the onset of the illness.

An autopsy was performed by one of us (Hertzog) forty-five minutes after death. The essential findings were limited to the brain. The subarachnoid space over the entire brain, including the cerebellum and the midbrain, was filled with a patchy yellow purulent exudate. The spinal cord was not removed. The base of the skull appeared normal. No evidence of any

suppuration could be found in the sinuses or middle ears. The findings in the abdominal organs were those of cloudy swelling. Smears and cultures from the brain showed *H. influenzae*. Postmortem blood culture showed *H. influenzae*. The anatomic diagnosis was diffuse suppurative meningitis due to *Haemophilus influenzae*, type B.

CASE 2.—L. M., a boy aged 2 years, had previously enjoyed good health. He was the only other child in the family. Like his older brother he also had a mild upper respiratory infection. Prior to his brother's illness he had been sleeping in the same bed with him. On Sept. 29, 1943, two days after the death of the older child, he vomited his evening meal. His parents noticed that he had a slight fever. He was seen by the family physician at 9 o'clock that night. His temperature was 102 F. He was very cooperative and had no complaints. There were no signs of any meningeal symptoms. The physician assured the family that influenzal meningitis was recognized as a noncontagious disease. At 5 o'clock the following morning the child showed muscular rigidity and convulsive movements. He was admitted to St. Barnabas Hospital at 8:05 a. m. on September 30. His temperature was 101.2 F. His neck was stiff and there were twitchings of the muscles of the extremities. There was cyanosis of the lips, and respirations were rapid. The leukocyte count was 8,950 with 43 per cent neutrophils, 12 per cent metamyelocytes, 7 per cent myelocytes, 29 per cent lymphocytes and 9 per cent monocytes. The smear showed toxic leukocytes with a definite shift to the left. A spinal puncture showed a turbid fluid with 2,660 cells per cubic millimeter. A differential count showed 96 per cent neutrophils. The spinal fluid sugar was 7.5 mg. per hundred cubic centimeters. A gram stain showed many pleomorphic gram negative bacilli. The organisms were typed by the Minnesota State Board of Health and found to be type B, *Haemophilus influenzae*. Cultures at both St. Barnabas Hospital and the Minnesota State Board of Health were positive for *Haemophilus influenzae*. Sulfadiazine was started by nasal tube. Also intravenous sulfadiazine and type B anti-*H. influenzae* rabbit serum were started intravenously. His temperature rose to 106 F. Respirations became irregular and he died at 12:10 p. m., approximately four hours after admission to the hospital. His entire illness lasted approximately eighteen hours.

An autopsy was performed by one of us (Hertzog) one hour and fifty minutes after death. The findings were similar to those in the first case. The subarachnoid space over the entire brain, including the cerebellum and the midbrain, was filled with a patchy purulent exudate. The superficial vessels of the brain showed pronounced congestion. No evidence of any suppuration could be found in the sinuses or middle ears. The only findings in the thoracic and abdominal organs were cloudy swelling. Smears and cultures from the brain showed *H. influenzae*. A postmortem blood culture also showed *H. influenzae*. The anatomic diagnosis was diffuse suppurative meningitis due to *Haemophilus influenzae*, type B.

COMMENT

The method of spread of influenzal meningitis is not well understood. The usual sporadic nature of the disease suggests carriers as a possible source of infection. In our cases, nose and throat cultures taken by the Minnesota Department of Health from parents and other contacts were negative for *H. influenzae*. The tendency to affect infants and young children almost exclusively suggests that the average adult is immune to the disease. Occasionally the disease follows subcutaneous abscesses,³ joint infections and tracheobronchitis⁴ and middle ear infections⁵ in which *H. influenzae* has been recovered prior to the onset of the meningitis. Positive ante-mortem blood cultures have been reported.⁶ Postmortem blood cultures are usually positive. In the majority of cases the disease appears suddenly in a previously healthy infant.

3. Dowds, J. H.: Pfeiffer's Bacillus Meningitis: Two Unusual Cases, *Lancet* 2: 100, 1940.

4. Neter, Erwin: Observations on Children with Influenzal Meningitis Who were Treated with Specific Serum, Sulfanilamide and Sulfapyridine, *Arch. Path.* 28: 603-604 (Oct.) 1939.

5. Watson-Williams, E.: Influenzal Meningitis in an Adult with Recovery, *Lancet* 2: 1430-1431, 1937.

6. Hamilton, T. R., and Neff, F. C.: Influenzal Meningitis with Bacteremia Treated with Sulfapyridine, *J. A. M. A.* 113: 1123-1124 (Sept. 16) 1939.

From St. Barnabas Hospital and the Department of Pathology of the University of Minnesota Medical School.

1. Levinson, A.: Meningitis, in Brennenmann, J.: Practice of Pediatrics, Hagerstown, Md., W. F. Prior Company, Inc., 1942, vol. 4, chapter 8, pp. 65-68.

2. Davis, D. J.: Influenzal Meningitis, *Arch. Int. Med.* 4: 323-330 (Oct.) 1909.

The relation of the disease to respiratory infections is not clear. Pittman⁷ has shown that practically all cases of influenzal meningitis are due to a smooth encapsulated strain of the organism that she calls type B. The organism usually found in the respiratory passages is a less virulent rough strain, although occasionally the type B smooth strain is isolated from the respiratory tract.

The former almost universally fatal course of the disease has been greatly reduced by the aid of the sulfonamide drugs and specific type B anti-influenza rabbit serum. In a series of 26 patients who lived more than forty hours Alexander⁸ reports a mortality of 35 per cent with specific serum alone. The specific serum also offers a rapid method of positive identification of a gram negative bacillus found in the spinal fluid by means of capsular swelling similar to the Neufelt reaction in typing pneumococci. Sako, Stewart and Fleet⁹ question the efficiency of the serum and report encouraging results from sulfadiazine alone.

These cases show that it is possible to have more than one child in a family contract influenzal meningitis and that the disease is potentially contagious. If other young children are present in a family where influenzal meningitis has occurred, prophylactic doses of sulfadiazine or passive immunization would seem indicated. According to Davis's² report of the disease in newborn twins, the incubation period is less than five days.

SUMMARY

Acute fulminating influenzal meningitis occurred in brothers. The older, aged 4 years, died within twenty-six hours after onset of the disease. The younger, aged 2 years, became ill two days later and died within fifteen hours. Autopsies showed diffuse suppurative meningitis due to type B *Haemophilus influenzae*.

DUODENAL ULCER CONCOMITANT IN IDENTICAL TWINS

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Identical or uniovular twins theoretically contain "identical determiners" in their chromosomes which constitute the chief physical basis of heredity; they are always of the same sex and of similar physical characteristics. They are therefore often of equally normal mental and physical pattern; likewise pathologic departures of close contrast, in both respects, are not unusual. Depiction of the spiritual communion manifest between twins has produced interesting reading; the Antipholus pair served by the Dromio identicals gave us Shakespeare's "Comedy of Errors." Numerous less prominent literatures and fictional authors have used the similarity to advantage.

Medical writers have interested themselves in the physiology of twinning and the study of twins in health and disease. Perusal of reference sources reveals case reports of diverse and seemingly innumerable pathologic entities common to identical twins. This survey, however, fails to produce a reported instance of a duodenal ulcer occurring in one or both of identical twins. A review of ulcer etiologic possibilities emphasizes "constitutional predisposition" and "tissue susceptibility" which might nicely have been exemplified by a report such as we are to make.

REPORT OF CASE

Ernest and Cecil, identical twins aged 28 years, resemble each other very closely in size, weight and general appearance. Through youth they developed along similar lines, accomplished equal educational achievements, married in the same year, neither reported siblings, artisans employed by the same concern, they have made essentially identical advancements. Both smoked excessively and drank moderately.

E. N. R. was hospitalized and adhered to an acceptable bed rest ulcer regimen, returning for eight weeks. An asymptomatic phase of eight months was thereby achieved, subsequent

to which relaxation from his regimen resulted in recurrent symptoms, which progressed with melena on the tenth month, obstructive symptoms and intractable pain on the twelfth month. Surgery was elected, and a subtotal gastrectomy done on Dec. 13, 1941.

His is an instance of postgastrectomy asthenia with loss of weight, quantitative dyspepsia, gastrocolic reflex with intermittent diarrhea and secondary anemia despite a gastroscopically and roentgenologically mechanically perfect resection. Achlorhydria was produced. There were no recurrent ulcer symptoms in an eighteen month follow-up nor any improvement in his

Measurements

	Twin E. N. R.	Twin C. W. R.
Height.....	64½ inches (163 cm.)	64 inches (162.5 cm.)
Weight.....	189 pounds (85.7 Kg.)	193 pounds (87.5 Kg.)
Past illnesses.....	Pneumonia, 1932	Influenza, 1932
Onset ulcer syndrome.....	June 1938	June 1939
Posteibal pain relieved by		
alkali.....	Present	Present
Night pain.....	2 years	3 months
Nausea.....	Absent	Absent
Vomiting.....	Absent	Absent
Quantitative dyspepsia.....	Present	Present
Localized supraumbilical pain	Present	Present
Gastric analysis:		
Free hydrochloric acid.....	41	52
Mucosal acidity.....	65	76
R.....	R., penetrating crater inferior surface	
trating crater lesser curvature just beyond		

postgastrectomy symptoms despite diet, hydrochloric acid, liver, vitamins parenterally and other measures.

C. W. R. refused hospitalization and has followed, indifferently, an ambulatory ulcer regimen. He has had one mild episode of melena. On three occasions he has put himself to bed for brief periods, on a modified Sippy regimen because of severe pain and persistent vomiting.

His brother's precedence has not encouraged him to accept further medical advice.

COMMENT

Each of these twins, therefore, appears to have developed identically complicated duodenal ulcers at the same period of life. This would seem confirmatory of the theory of constitutional predisposition; identical twins should be expected to be of similar tissue susceptibility. The surgical experiences of the one affecting the decisions of the other leaves one gastro-intestinally uncomfortable despite acceptable management, the other with active ulcer symptoms. Speculation as to the outcome of surgery should it become compulsory to the second twin is interesting.

We have added a pathologic entity occurring in identical twins, namely duodenal ulcer.

Our findings may lend support to the hypothesis of constitutional predisposition.

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TREATMENT OF THE LIP AND CHEEK IN CASES OF FACIAL PARALYSIS

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A new simple method of supporting the lip and cheek in cases of Bell's palsy or facial paralysis has been found to be successful in a number of instances. It is necessary to give this support to prevent the droop and loss of tone that is so characteristic of these tissues in facial paralysis.

This method consists in cradling the lip and cheek in a translucent plastic support and connecting that support by rubber band tension to a metal hook that is fastened to the last upper molar on the affected side (fig. 1).

The lip support or cradle (A-B) is the part that actually lifts the lip and cheek under tension from the rubber band. It consists of two flanges and a connecting bar that is shaped to conform to the closed lips (fig. 2). The flanges should be large enough to keep the tissues from bunching at the angle of the mouth.

7. Pittman, Margaret: The S and R Forms of *Haemophilus influenzae*, Proc. Soc. Exper. Biol. & Med. 27: 299-301, 1929-1930.

8. Alexander, H. E.: Treatment of Bacterial Meningitis, Bull. New York Acad. Med. 17: 100-115, 1941.

9. Sako, Wallace; Stewart, C. A., and Fleet, Joel: Treatment of Influenzal Meningitis with Sulfadiazine; J. A. M. A. 119: 327-331 (May 23) 1942.

From the Department of Medicine, Tulane University School of Medicine, and the Gastroenterology Clinic of Touro Infirmary.

Dental pink base plate wax is used to model the lip support. Care should be taken to keep the flanges from spreading away from each other under tissue pressure while it is being fitted. The wax model can then be reproduced in a translucent acrylic resin which is not at all unsightly or conspicuous. It is also light in weight, not irritating to the tissues, easy to keep clean and easily processed.

The band (C) around the molar is constructed similarly to the bands used in orthodontia appliances or in gold crowns except that it is never necessary to cut into the tooth. If the contact between the last two teeth is so close that a band cannot be passed over the tooth, this can be remedied by encircling the contact point with a 26 gage wire and twisting the ends to make it tight. In a matter of a few days there will be a space between the teeth, and the fitting and placement of the band may proceed. Gold of 22 karat and 30 gage has been found very satisfactory for the band. To this is soldered the hook (D), which is contoured of half round 17 gage dental clasp wire. The positioning and soldering of the hook is done best on a model made of a heat resisting material such as is used in ordinary dental soldering technics. The hook should be placed as high in the cul-de-sac as is consistent with the activity of the surrounding tissues. It should also be adapted close to the alveolar process above and posterior to the tooth.

The band (C) should then be placed on the tooth in the mouth for trial, and adjustments made to the hook (D) so that the proper direction of pull on the lip is obtained. The direction of pull should be up and back and is governed by the amount of lip droop, the length and anatomic conformation of the lip, the amount of fat tissue present and the restriction of the surrounding tissues. The band may then be cemented in place.

Several holes for rubber band attachment are drilled in the inner flange of the lip cradle, as can be seen in the illustration. A small rubber band (E) is fastened to the flange by looping one end of the rubber band through a hole and then back through the other end of itself. It is generally an easy matter for the patient to stretch the free loop end of the rubber band over the end of the forefinger and pass it back over the hook while holding the lip cradle in the palm of the hand. The cradle

examination. If the alveolar bone about the tooth in question has receded very much, it is better to consider the possibilities of the next tooth forward. The difficulty with using a tooth too far anterior is that enough distance for adequate tension of the rubber band is not always obtained. Carious areas in the tooth should of course be filled, and calicular deposits should be removed.

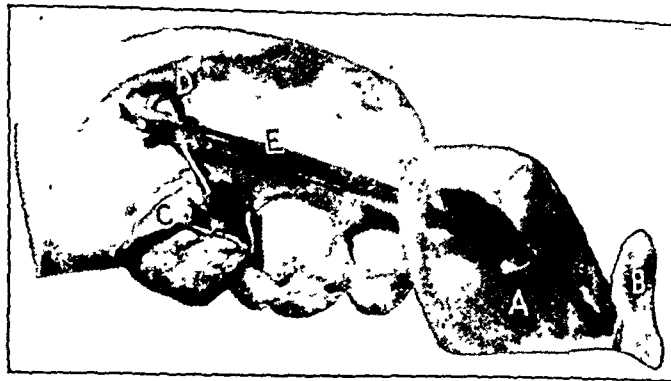


Fig. 2.—Plastic lip cradle (A B), rubber band (E), hook (D) and band (C) on a plaster cast of the maxillary teeth.

Study must also be made of the excursions of the anterior border of the ascending ramus of the mandible in lateral movements and in opening and closing the jaws. This will determine to some extent the position of the hook. In some cases the anterior border of the ramus will be found in almost direct contact with the mucosa of the alveolar process above the molars when the mandible is moved to the opposite side. In this event it may be impossible to place the hook in an advantageous position, and the technic may have to be modified or abandoned.

This method of lip and cheek support offers several advantages over other methods. It eliminates the conspicuousness which is so striking when adhesive tape or ear attachments and vulcanite are used. The translucent cradle is not very noticeable. The discomfort of traction over an ear and the messiness of adhesive tape are done away with. The device, once established, is easy to apply and use. It also gives better control of the tissues than do the other methods. Most important of all, the patient will use this appliance consistently at all times, whereas he did not do so with the others. Use of the device should be maintained until normal muscle function returns.

122 South Michigan Avenue.

SENSITIVITY TO THIOURACIL

REPORT OF THREE CASES

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In view of the recent reports¹ on the treatment of hyperthyroidism with thiouracil, several cases were selected for this type of therapy. Nine cases have been treated to date and three have exhibited manifestations of drug sensitivity.

Our purpose in this report is to point out the toxic effects observed in the treatment of relatively few patients. It is not our desire at this time to comment on the efficacy of the drug in the treatment of hyperthyroidism.

CASE 1.—A man aged 55 complained of nervousness, sweating, weight loss, protrusion of the eyeballs, palpitation and exertional dyspnea. There was no past history of allergy. On examination there were noted moderate exophthalmos, an enlarged thyroid gland, moist palms and a tremor of the outstretched hands. The heart was overactive, with a rate of 120. The blood pressure was 150/70 mm. of mercury. The basal metabolic rate on two occasions was plus 41 per cent and plus 42 per cent. The hemogram was normal.

After a test dose of 0.2 Gm. of thiouracil he received 0.6 Gm. the first day and 1 Gm. daily thereafter. After ten days of

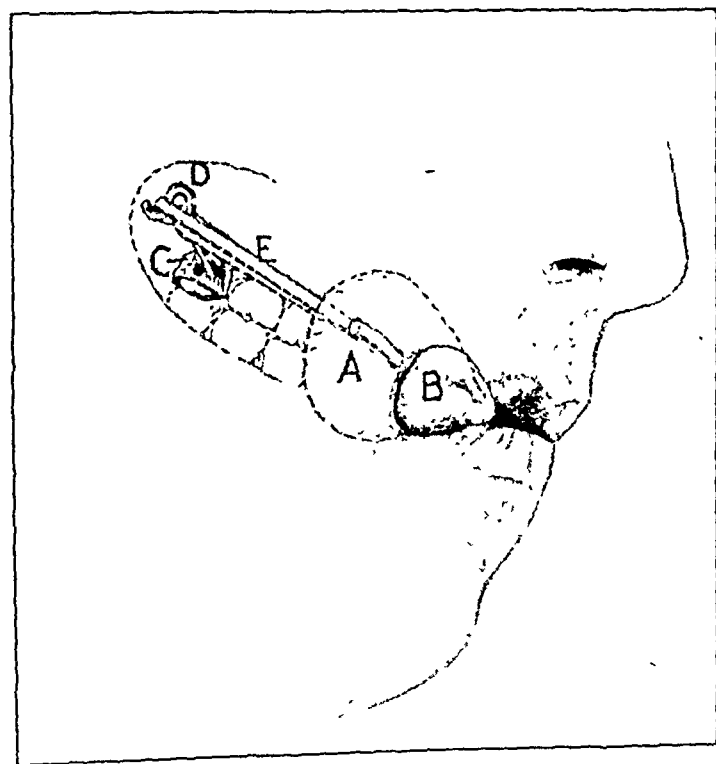


Fig. 1.—Diagrammatic view of appliances for supporting the lip and cheek. A is the flange of the cradle inside the cheek and B the outer flange. This pulls the lip under traction from the rubber band, E, which is attached to the hook, D, on the gold band, C.

can easily be placed in position at the angle of the mouth. Experiment will determine the tension and size of the rubber band to be used and which holes in the appliance are the most effective to use for fastening the bands.

Preparation of the tooth and the metal band to which the hook is soldered should be preceded by dental x-ray and clinical

The thiouracil used was furnished by Lederle Laboratories, Inc. From the Medical Services of Dr. George Baehr and Dr. Eli Moschowitz, the Mount Sinai Hospital.

1. Astwood, E. B.: Treatment of Hyperthyroidism with Thiourea and Thiouracil, J. A. M. A. 122: 78 (May 8) 1943. Williams, R. H., and Bissell, G. W.: Thiouracil in the Treatment of Thyrotoxicosis, New England J. Med. 229: 97 (July 15) 1943.

treatment he complained of chilliness and malaise, and his temperature rose to 102.4 F. A moderate generalized lymphadenopathy was noted, and infectious mononucleosis was suspected. This was excluded by the finding of a normal hemogram and a negative blood heterophile reaction. The day after the febrile rise a diffuse erythematous maculopapular eruption was noted. Thiouracil toxicity was suspected and the drug was discontinued, although phenobarbital, which he had been receiving, was continued. Twenty-four hours after the cessation of the administration of thiouracil the temperature returned to normal, and in a few days the rash began to fade. Iodine was subsequently administered, and the patient underwent an uneventful subtotal thyroidectomy.

CASE 2.—A white woman aged 30, with a past history of Darier's disease and a cholecystectomy, had had a subtotal thyroidectomy for toxic diffuse goiter one year before. The pathologic report was "hyperplastic thyroid as seen in Graves' disease in a colloid phase." Her basal metabolic rate fell from plus 71 per cent preoperatively to minus 8 per cent postoperatively. She entered for the fourth time because of weight loss, nervousness, palpitation and easy fatigability. There was no past history of allergy.

On examination she was very obese, perspiring and flushed. There was no exophthalmos, lidlag or stare. There was an indurated thyroidectomy scar. Her heart rate ranged between 80 and 100. The blood pressure was 160/106 mm. of mercury. The basal metabolic rate was plus 38 per cent and plus 47 per cent. The blood sugar was 165 mg. per hundred cubic centimeters. In view of the evidences of recurrence of toxic diffuse goiter, the patient was given thiouracil 1 Gm. daily, administered in five divided doses. At the end of the eighth day of treatment her temperature rose to 100.6 F. The next day the temperature was 105 F. No chill was experienced. There were no physical findings to account for the fever. The administration of the drug was therefore stopped, and the temperature fell slowly over a period of two days. The day after her temperature had risen to 105 F. a purplish red maculopapular eruption appeared on the arms. The rash cleared in two days. One week after the cessation of the administration of thiouracil, and after her temperature had become normal and the rash had cleared, she was given 0.2 Gm. of thiouracil. She had a chill, a rise in temperature to 105.4 F. and a reappearance of the skin eruption on the arms. Her temperature fell to normal in one and a half days, and the rash disappeared in three days. Patch and scratch tests with thiouracil were negative. She received barbiturates throughout her stay in the hospital without adverse effects. Since thiourea was not available, the patient was given strong solution of iodine (Lugol's solution) in preparation for a secondary thyroid operation.

CASE 3.—A woman aged 47 complained of nervousness, tremor, intolerance to heat and a weight loss of 27 pounds (12 Kg.). She had been given strong solution of iodine intermittently during the past four months. The patient was nervous, apprehensive and overactive. The thyroid gland was slightly enlarged. There was no exophthalmos, lidlag or stare. The blood pressure was 160/80 mm. of mercury. The pulse ranged between 90 and 110. The basal metabolic rate was plus 34 per cent on two occasions. The circulation time was 8 seconds (arm to tongue). The white blood cell count was 6,250 with 57 per cent segmented polymorphonuclear leukocytes, 4 per cent nonsegmented polymorphonuclear leukocytes, 34 per cent lymphocytes and 5 per cent monocytes. The patient was given 1 Gm. of thiouracil a day in five divided doses. Her basal metabolic rate fell to plus 23 per cent and the pulse slowed to between 80 and 90 per minute, but her weight remained stationary. After sixteen days of therapy the white blood cell count fell to 2,650 with a differential of 59 per cent segmented polymorphonuclear leukocytes, 4 per cent nonsegmented polymorphonuclear leukocytes, 28 per cent lymphocytes, 4 per cent monocytes and 5 per cent eosinophils. It was deemed advisable to stop the administration of the drug. She was then prepared for subtotal thyroidectomy by strong solution of iodine, which she underwent uneventfully. The pathologic report was "hyperplastic thyroid gland as seen in Graves' disease in a colloid phase."

CONCLUSION

Nine patients with hyperthyroidism were treated with thiouracil, and 3 developed untoward effects from the drug. One developed fever, generalized lymphadenopathy and dermatitis. Another exhibited fever and dermatitis. In the third a moderate leukopenia occurred.

Fifth Avenue and One Hundredth Street.

Special Article

AMERICAN HEALTH RESORTS

UNDERWATER THERAPY AT SPAS

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These special articles on spa therapy and American health resorts were prepared under the direction of the Committee on American Health Resorts. The opinions expressed are those of the authors and do not necessarily reflect the opinion of the committee. These articles may be published later as a Handbook on Health Resorts.

Present day underwater therapy embodies three of the basic principles of physical medicine: (1) hydrotherapy, (2) therapeutic exercise based on a thorough knowledge of muscle anatomy and action and (3) massage. Regardless of the type of water or apparatus used and of the disease to be treated, these principles hold and their application is based on definite physiologic responses of the body to their use.¹ By giving therapeutic exercise and massage in water, certain mechanical advantages are obtained which increase the range of physiologic effect and permit a more accurate and satisfactory exercise dosage to be given.² There is nothing "specific" in this form of therapy. Results obtained from using it are directly proportional to the diagnostic acumen of the physician and the skill and training of the physical therapist giving the treatment.

The use of water, exercise and massage in the treatment of disease is as old as man, and the evolutionary development of these agents, their discovery and rediscovery, form one of the interesting chapters in medical history. In the earlier English literature the terms hydrotherapy and balneotherapy are used synonymously to describe treatment with water. In 1905 Hermann and Parkes Weber differentiated between these two terms, using hydrotherapy to designate outward application of water to the body and balneotherapy to indi-

1. Krusen, F. H.: *Physical Therapy in Arthritis*, New York, Paul B. Hoeber, Inc., 1937; *Physical Medicine*, Philadelphia, W. B. Saunders Company, 1941. Lowman, C. L.: *Physical Equipment of Therapeutic Pools*, J. A. M. A. 94: 845-849 (March 22) 1930; *Postoperative Use of Therapeutic Pools*, Northwest Med. 30: 538-541 (Dec.) 1931; *Underwater Gymnastics*, J. A. M. A. 97: 1074-1076 (Oct. 10) 1931. Currence,^{*} Lowman.³

2. Smith, E. M.: *Underwater Therapy in Chronic Arthritis*, Arch. Phys. Therapy 16: 534-536 (Sept.) 1935; *Underwater Therapy in the Treatment of Chronic Arthritis*, J. Arkansas M. Soc. 32: 137-138 (Feb.) 1936; *Physical Therapy in Chronic Atrophic Arthritis*, Arch. Phys. Therapy 18: 622-626 (Oct.) 1937. Crook, B. L.: *Outwitting Arthritis*, Hygieia 16: 105-108 (Feb.) 1938; *Recent Research in the Treatment of Early Poliomyelitis*, read at the joint meeting of the American Health, Recreation and Physical Education Association with American Physiotherapy Association, New Orleans, April 1942; footnote 31.

cate bathing at a resort or spa.³ Later this term was applied to anything pertaining to spa therapy. The use of massage under water was practiced by the early Greeks and Romans and was carried from Rome to Egypt and then back to France and Aix-les-Bains by Napoleon's soldiers at the end of the eighteenth century.⁴ Peter Henry Ling (1776-1839) and Hjalmar Frederick Ling (1820-1886) developed a system of medical gymnastics in Sweden that was based on the physiology of the times. In the early part of the present century two American physicians, Lovett⁴ and Lowman,⁵ laid the ground work for our present day concept of therapeutic exercise.

INFLUENCE OF GRAVITY ON MUSCLE ACTION

Lovett, while working with infantile paralysis during the epidemic of 1914 in Vermont, made the contribution of specific muscle training or muscle reeducation and was the first to call attention to the influence of gravity on muscle action. By this work he established standard tests by which muscle power can be graded and appropriate exercises administered. He classified therapeutic exercises as those performed with the aid of gravity, those performed with gravity neutralized and those performed against the force of gravity. He stressed the importance in muscle training or reeducation of a thorough knowledge of muscle anatomy and muscle action. His concepts were forwarded by Legg and Merrill⁶ and others and, as a consequence, a systematic method of reeducation of weakened and atrophied muscles by exercise was developed.

Between 1910 and 1920 Lowman, working with spastic paralysis and later on infantile paralysis, began the development of an entirely new concept of therapeutic exercise wherein the exercise was given while the body was immersed in water. He too emphasized a thorough knowledge of muscle anatomy and action but in addition he applied the laws of hydraulics to a body immersed in water and showed that the buoyancy of the water, acting in opposition to gravity, enabled the patient to move freely in all planes. Lowman's concept also took into account not only the buoyancy of the water but the hydrostatic pressure, viscosity and the pressure of water as related to velocity of motion in water. By immersing a patient in water, Lowman was able to demonstrate that fixation of a muscle or muscle groups may be obtained by the operator or by the active stabilization of the patient's own muscles and, by gradation of difficulties of movement in water, he worked out seven variations of exercises. In each gradation it is presumed that the origin of the muscle is held firm by the operator or by means of muscular fixation. These seven variations are classified as follows: (1) active passive movement, (2) contraction against viscosity, (3) movement aided by buoyancy but against the pull of gravity and the weight of superincumbent water, (4) resistive action, (5) contraction of the muscle from both origin and insertion, (6) contraction against gravity and (7) stabilization of base of action.⁶

TEMPERATURE OF WATER

The effects of a variance of heat and the exact temperature which might be optimum for handling disabilities came then to the attention of the investigators.⁷ The first therapeutic pools were considered chiefly to be of importance as a medium for promoting bodily movement. Interest developed slowly in possible physiologic effects to be derived from changing the temperature of the water.⁸ The general opinion seemed to be that the temperature of the therapeutic pools should be kept constant at 93 to 95 F. in order to be completely neutral in effect on muscles paralyzed by anterior poliomyelitis. As muscle reeducation under water gained in popularity, investigators began a study of the effect of a higher temperature, especially in the treatment of spastic muscles. It became generally accepted that a temperature of around 98 to 100 F. was optimum for the relaxation of spastic muscles. Thus we find that most institutions had more than one pool. In the warm pool poliomyelitis was treated, and in a very warm pool spastics were treated.

A keyhole shaped tub was designed by C. P. Hubbard in order that underwater exercises might be given in a relatively small space, and, more important, that the temperature of the water might be changed as rapidly as necessary to treat differing conditions.

Later John Currence improved on this design by adding a thermostatic control and an underwater douche or whirlpool and by modifying the shape and construction of the Hubbard tub. This finally perfected tub was called the Hubbard-Currence tub. In this tub it is possible to start the treatment of each patient with the water at a given temperature and gradually increase the temperature by several degrees and then lower the temperature for the remainder of the treatment.⁸

In 1927 the Georgia Warm Springs Foundation was organized through the influence of Franklin D. Roosevelt as a medical institution for the study and treatment of the after-effects of infantile paralysis.⁹ These natural spring waters at a temperature of 89 F. provided an excellent medium for underwater exercise, and this form of therapy thus has gained considerable publicity and popularity.

The further study and development of underwater therapy has been advocated by a number of recent writers and authorities on physical medicine. Nylin,¹⁰ Sherwood,¹¹ Frazier,¹² Walker,¹³ Olsen¹⁴ and others in writing on arthritis recommend the warm pool for relief of muscle pain and spasm and comment on the importance of the elimination of body weight due to the buoyancy of the water. Lowman⁵ states that, "in painful conditions involving the joint, release of joint friction due to the absence of weight of part, or lessening of the gravity load, makes joint action possible with lessened or no pain, through a much larger arc of move-

7. Coulter, J. S.: *Underwater Treatment: Hydrogymnastics*, in Piersol, G. M.: *Cyclopedia of Medicine*, Philadelphia, F. A. Davis Company, 1939, pp. 637-643. Kovács, R.: *Yearbook of Physical Therapy*, Chicago, Year Book Publishers, Inc., 1942. Krusen, J. Lowman,⁵ Elson and Hawkins.¹⁰

8. Currence, J. D.: *Improved Underwater Therapy*, *Mod. Hosp.* 50: 86-88 (April) 1938; *An Improved Method of Underwater Treatment of Arthritis*, *Arch. Phys. Therapy* 29: 84-87 (Feb.) 1938; *Underwater Therapy in Arthritis*, *ibid.* 16: 291-294 (May) 1935.

9. Hubbard, L. W.: *Hydrogymnastics*, *Internat. Clin.* 3: 212-215 (Sept.) 1933.

10. Nylin, J. B.: *Hydrotherapy: General Principles*, *Arch. M. Hydr.* 11: 157 (May) 1933; *Underwater Exercises*, *ibid.* 16: 44 (April) 1935.

11. Sherwood, K. K.: *Physical Therapy in Arthritis*, *Physiotherapy Rev.* 20: 134-137 (May-June) 1940.

12. Frazier, V. E.: *Underwater Therapy in Chronic Arthritis*, *J. Missouri M. A.* 37: 192-193 (May) 1940.

13. Walker, P. J.: *The Orthopedic Management of Arthritis*, *Physiotherapy Rev.* 19: 337-339 (Nov.-Dec.) 1939.

14. Olsen, A. B.: *Indications for Hydrokinesitherapy*, *Arch. Phys. Therapy*, 16: 295-298 (May) 1935.

3. Rolleston, H.: *The History of Physical Medicine*, *Brit. J. Phys. Med.* 12: 140-144 (Nov.) 1937.

4. Lovett, R. W.: *The Treatment of Infantile Paralysis*, Philadelphia, P. Blakiston's Son & Co., 1917.

5. Lowman, C. L.: *Technique of Underwater Gymnastics*, Los Angeles, American Publications, Inc., 1937.

6. Legg, A., and Merrill, J.: *Physical Therapy in Infantile Paralysis*, in Mock, H. E.; Pemberton, Ralph, and Coulter, J. S.: *Principles and Practice of Physical Therapy*, Hagerstown, Md., W. F. Prior Company, Inc., 1932, vol. 2, chapter 8.

ment than is otherwise made. In congested and painful joints full of inflammatory debris, and even in septic cases, this increase in the arc of painless movement aids materially in hastening the elimination of exudates, prevents adhesions and reduces the amount of atrophy of the muscle actuating that particular joint. Clinically there is evidence of improved circulation from standing and walking in deep water."

Allman,¹⁵ Hansson,¹⁶ Hubbard⁹ and others believe that the therapeutic pool when properly installed and equipped is the most nearly perfect of hydrotherapy measures if staffed by a competent physical therapist under the guidance of a physician. Hansson,¹⁶ Atsatt,¹⁷ Lowman⁶ and many others emphasize the beneficial psychologic effects obtained in therapeutic pool treatments. Brockway¹⁸ writes of the effectiveness of saline pools. Currence⁸ and Elson and Hawkins¹⁹ discuss the advantages of the Hubbard or Hubbard-Currence tub technic.

Although Lowman used heated water in some of his work, his primary interest was in the science of movement in water, and in his earlier writings he had little to say about the use of water as a therapeutic agent or of the use of massage under water.

INTEREST IN EUROPE

Soon after the first world war considerable interest was developed in European health resorts, particularly in the ones having mineral or thermal waters as a natural resource. The European literature of this period is voluminous.²⁰ Great stress is placed on the specific properties of the various waters and their physiologic effects. Therapeutic exercise played a minor role. Provisions were made at the better bathing establishments for walking in the pools, but the scientific application of the basic principles laid down by Lowman were disregarded. Strasser²¹ wrote at length on the scientific foundations of hydrotherapy without mentioning the subject of therapeutic exercises. In writing on the use of thermal waters of Bath, England, Gordon²² describes the pool and briefly explains how patients are placed in the pool, where passive movements of the legs are carried out and he is encouraged to kick out in any direction he can."

It was during the first world war that the undercurrent douche came to be used in the treatment of war injuries. This was similar to the individual exercise tub used in America except that the emphasis was placed on the importance of the thermal whirlpool effect of the undercurrent douche rather than on any exercise program.²³

During the decades from 1920 to 1940 several European writers evidenced interest in underwater therapy in pools. Much was written on the temperature of the water. At Bath, England, spastic paralysis was treated in pools maintaining an average temperature of 102 to 104 F.²⁴ In London, Ray²⁵ mentions the use of three temperatures for the pool bath in the treatment of arthritis. These he gave as 100, 102 and 104 F. Patients were urged to walk about in the water and manipulate an underwater douche themselves, directing the stream of hot water against painful joints. This combination of whirlpool with large therapeutic pool is unique. Kersley²⁶ advocates the use of water combined with plaster immobilization in the treatment of rheumatoid arthritis and recommends a hot pool of 102 F. He merely suggests that the manipulator, who is in the water with the patient, may put the limbs through the desired range of motion and allow him to perform assisted or resisted exercises or walk along parallel bars. Freund²⁷ states that in typical hemiplegia an early beginning should be made with passive movements, massage to the muscles and the practice of movements in a deep bath at indifferent temperature.

From 1940 to the present time, interest in Europe has been centered on the treatment of war injuries. Holmes²⁸ states that, with the obvious increase of war injuries, special consideration should be given disabilities which may be helped by hydrotherapy. Acknowledging that patients in spa hospitals receive the benefit of orthopedic advice and treatment, he says he knows of no orthopedic institution in Great Britain which has a hydrotherapy department. He remarks "Experience in the treatment of rheumatic diseases of both private and hospital spa practice has convinced me that hydrotherapy is the most useful form of physical treatment in these conditions, wherein moist heat is generally more efficacious than dry heat." Ray²⁹ quotes Lowman in reference to the use of the therapeutic pool and urges the use of the therapeutic pool,³⁰ saying that "for some unexplained cause the therapeutic pool, apart from the spas, has never attained the popularity in this country that it has in America. A few institutions have installed them, and the sole object of this paper is to urge the importance of a rapid increase in their number."

THERAPEUTIC POOL VERSUS CASTS

In 1939 Hipps and Crook, working with thermal saline waters, were of the opinion that a therapeutic pool is an essential part of the physical therapy department. In the treatment of acute poliomyelitis cases they found that the hot pool is most effective. At that time most institutions were keeping patients in casts for weeks or months following infantile paralysis. There was a vogue for extreme length of casting. They used an opposite technic, one of no casting and extremely early pool therapy. Poliomyelitis patients were placed in the hot salt pool as soon as the fever subsided. They found that the acute muscle soreness, probably associated with spasm, left within a few days, that contrac-

15. Allman, D. B.: Hydrotherapy and Its Use at the Betty Bacharach Home, *J. M. Soc. New Jersey* 35:735-737 (Dec.) 1938.

16. Hansson, K. G.: Hydrogymnastics in Infantile Paralysis, *Arch. Phys. Therapy* 12: 539 (Sept.) 1931. After Treatment of Poliomyelitis, *J. A. M. A.* 113: 32-35 (July 1) 1939.

17. Atsatt, R. F., and Ussher, N. T.: Atrophic Arthritis: A Logical Regime for Treatment, *Physiotherapy Rev.* 18: 235-239 (Sept.-Oct.) 1938.

18. Brockway, A.: Osteomyelitis and Suppurative Joints: Salt Water Pool Treatment, *California & West. Med.* 46: 174 (March) 1937; *abstr. J. A. M. A.* 108: 1573 (May 1) 1937.

19. Elson, J. C., and Hawkins, F. M.: Hydrotherapy Treatment in a General Hospital, *Brit. J. Phys. Med.* 7: 96-98 (Sept.) 1932.

20. Delacroix, A.: The Treatment of Arthritis with Mineral Radioactive Waters, *Arch. M. Hydr.* 10: 82-83 (Aug.) 1932. Fox, J. T.: Notes on the Sedative Pool, *ibid.* 7: August 1929. Collwitzer-Meier, K.: Kreislauf und Atmung im Bad, *Balneologie* 2: 289-299 (July) 1935; *abstracted, Arch. M. Hydr.* 14: 214 (Oct.) 1936. Valette, Clogne and Drillon: The Skin: Reaction to Baths, *abstracted, ibid.* 12: 279 (Oct.) 1934. Strasser,²¹ Gordon.²²

21. Strasser, A.: The Scientific Foundations of Hydrotherapeutics, *Arch. M. Hydr.* 1: 16-21 (May) 1922.

22. Gordon, R. G.: The Use of Thermal Waters in Paralysis, *Arch. M. Hydr.* 5: 162 (May) 1924.

23. Hebbethwaite, S. M.: The Use of Manipulation Baths for the Relief of Pain in the Course and Distribution of Nerves, *Arch. M. Hydr.* 3: 6-8 (Jan.) 1925. Holmes, G.; Thomson, F. G., and Shipton, W.: The Undercurrent Douche in England, *ibid.* 13: 29 (April) 1935. Smith and Lutterloh.³¹

24. Gordon, R. G.: The Use of Thermal Waters in Paralysis, *Arch. M. Hydr.* 3: 95 (June) 1923.

25. Ray, M. B.: The Treatment of Chronic Rheumatic Disorders: Hydrological Methods at the British Red Cross Clinic for Rheumatism, *Arch. M. Hydr.* 11: 109-112 (Jan.) 1933.

26. Kersley, G. D.: Hydrology Coupled with Plaster Immobilization in the Treatment of Rheumatic Arthritis, *Arch. M. Hydr.* 15: 48-49 (April) 1937.

27. Freund, E.: Physical Therapy in Paralysis and Neuroses, *Arch. M. Hydr.* 15: 285 (July) 1937.

28. Holmes, G.: Hydrotherapy as a Means of Rehabilitation, *Brit. J. Phys. Med.* 5: 93-95 (May-June) 1942.

29. Ray, M. B.: The Therapeutic Pool, *Lancet* 1: 683-685 (April) 1940.

30. Ray, M. B.: Hydrotherapy in the Rehabilitation of Nerve Lesions, *Brit. J. Phys. Med.* 15: 11-16 (Jan.) 1942.

tures were avoided and that the patients were ready for exercise and massage under water much sooner. They also stated that these patients regained muscle power much more rapidly than patients who did not have these treatments.³¹

Studies were made by these workers under a grant from the National Foundation for Infantile Paralysis comparing the results obtained in treating patients with early pool therapy as contrasted with patients having had casts and with patients having had no treatment.³² The group receiving early pool therapy showed 68 per cent improvement as compared to only 33 per cent improvement in patients treated with casting and late physical therapy, and of 31 per cent improvement in patients having had no physical therapy. The chief conclusion was that those who received careful early pool therapy showed much better recovery than those treated otherwise. Subsequent pathologic studies on old paralyzed muscles gave evidence of the accuracy of these conclusions.³³

CONTINUOUS HYPEREMIA

While working with radioactive thermal waters in a therapeutic pool at a temperature of 98.6 F. over a period of years beginning about 1933 at Hot Springs, Ark., we found that the maintenance of the constant temperature of the pool resulted in an increase in the range of physiologic response in a manner most gratifying.³⁴ We found that, if the exercises are administered during the time the body is immersed in water at a temperature of 98.6 F., a continuous hyperemia is maintained during the entire time the muscles are actively moving. This hyperemia, assisted by the buoyancy of the water, produces general relaxation of the central nervous system. Muscle pain and muscle spasm are reduced if not entirely eliminated temporarily. The arc of motion in affected joints may be increased painlessly. This temperature is sufficient to produce definite peripheral dilatation, which increases the flow of the blood and lymph to the parts, stimulates the nutrition of muscular tissue and promotes the elimination of toxic waste materials. This elevation of temperature seems to increase the tolerance of muscles to exercise and at the same time proportionately to decrease the cumulative products of fatigue by their rapid removal. The continuous capillary dilatation during the actual time of muscle movement greatly facilitates the breaking down and excretion of organized inflammatory exudates in and around the muscles and joints. This method of applying heat during the entire time of exercise we believe to be obviously superior to that of superficial heating or "baking" followed by an exercise program which is necessarily given as the affected part rapidly loses heat. The hyperemia produced by the dry heat is not constant; there is a consequent capillary contraction and retention of toxic waste mate-

rial. This reduces the exercise dosage because of the development of fatigue. Other physiologic responses we noted were that the pulse rate and respiratory rates are slightly increased and there is a lowering of blood pressure and a rise of body temperature from 1 to 2 degrees above normal, although the temperature of the water is neutral. These changes persist as long as four hours after treatment, and after the treatment the patient is relaxed and has a desire for sleep.

UNDERWATER MASSAGE

We found that underwater massage greatly enhances the value of the underwater treatment. If massage is given during the time the body is immersed in warm water, the continuous peripheral capillary dilatation and generalized interchange of blood from the deeper congested areas to the surface of the body render the massage much more effective in speeding the removal of waste products.

Underwater massage generally precedes the exercise period. With the body floating in water there is no appreciable strain on weakened muscle or inflamed joints. There is no weight to be lifted either by the patient or by the operator, and therefore the patient is more at ease and more receptive. The operator has both hands free for massage movements. The massage movements follow the muscle groups and should be both gentle and rhythmic. Light effleurage (stroking) is started as soon as a hyperemia is attained. This is given to the muscle groups above and below the affected joints, when joints are involved. Massage given about the joint structures depends on the acuteness of the joint symptoms. Only effleurage and petrissage (kneading) are used generally, with some gentle friction given around the joints in some cases. If tendons are contracted, these can be stretched gradually with gentle traction and reverse stroking, slowly becoming more forceful as relaxation is achieved. All sudden strong movements are contraindicated, however, and heavy massage is definitely detrimental. Careful and intelligent work in massage is most essential.

UNDERWATER EXERCISE

The type of underwater exercise given and the dosage depend on the condition of the individual patient, the type of disease, the duration of the disease, the acuteness of the disease, the age of the patient and many other factors. We believe that passive movement is useful in teaching the patient the possible range of his muscle action but that muscle training to be effective must be active. More than that, it requires concentrated mental effort on the part of the patient after he has been taught the origin, insertion and action of the muscles involved. Complete cooperation and understanding must exist between the patient and the physical therapist. We found that patients who eagerly learned how to perform isolated and group muscle actions in a well coordinated manner were soon able to progress from the assistive active exercises to active, or free, and finally resistive exercises. Those patients who were not fully cooperative did not progress so rapidly. We found it invariably true that children coordinate and localize muscle actions much more quickly and accurately than adults. One of the most important physiologic effects of performing exercises under water is that pain and muscle spasm are reduced. As a result the patient can tolerate more motion in painful joints, and the arc of movement can gradually be increased without discomfort. Exercises should be

31. Crook, B. L.: *The Use of Aquatics in the Rehabilitation of Crippled Children*, in Collins, E. K.: *Swimming Pool Data and Reference Annual*, New York, Hoffman-Harris, Inc., 1939.

32. Hips, H. E.: *Muscle Behavior Following Infantile Paralysis*, *Am. J. Surg.* 53: 314-318 (Aug.) 1941.

33. Hips, H. E.: *Muscle Pathology in Anterior Poliomyelitis*, *South. M. J.* 34: 135-146 (Feb.) 1941; *The Clinical Significance of Certain Microscopic Changes in Muscles of Anterior Poliomyelitis*, *J. Bone & Joint Surg.* 1: 68-80 (Jan.) 1942.

34. Smith, E. M.: *Underwater Therapy Applied to Chronic Atrophic Arthritis*, *Tr. Am. Therap. Soc.* (1937) 37: 67-68, 1938; *Health Resort Therapy in the United States*, read at the meeting of the American Therapeutic Society, Cleveland, Ohio, 1941. Smith, E. M., and Lutterloh, C. H.: *Spa Therapy in Rheumatic Diseases*, *Arch. Phys. Therapy* 21: 141-143 (March) 1940. Fletcher, G. B.: *Underwater or Pool Treatment of Certain Conditions of Muscles and Joints*, *Tri-State M. J.* 12: 2411-1213 (Jan.) 1940. Martin, L. G.: *Underwater Physiotherapy and Pool Therapy*, *J. Arkansas M. Soc.* 30: 229-230 (April) 1934. Wootton, W. T.: *The Spa Treatment of Arthritis*, *South. M. J.* 30: 898-901 (Sept.) 1937. Smith.²

performed slowly, rhythmically and through as great an arc of motion as is possible short of pain. As the result of the buoyancy of the water, the body weight is removed from the joints. This relieves strain on weakened muscles and, more important, eliminates trauma on interarticular surfaces. We found that patients who walked only with extreme joint pain outside the water could walk easily and comfortably in water of shoulder depth. Relatively free movement can be obtained in all planes. Shortened muscles can be lengthened gradually with stretching manipulations. In general the exercise program is directed toward the prevention or correction of deformities, the reeducation of atrophied muscles and the restoration of normal body mechanics. An important part of posture training is the teaching of activities used in everyday life, such as going up steps, getting up and down in a chair, sitting and walking.

The longer deformities are allowed to persist, the more difficult they are to correct.

Best results are obtained when patients are given early and adequate hydrotherapy treatment.

We believe that properly staffed hydrotherapy departments adequately equipped with therapeutic pools, Hubbard-Currence tubs and whirlpools should be standard in every health resort in the United States which uses natural thermal waters in the treatment of disease.

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

THE COUNCIL ON PHARMACY AND CHEMISTRY HAS AUTHORIZED EXCLUSIVE USE OF THE METRIC SYSTEM IN ALL PUBLICATIONS FOR WHICH IT ASSUMES RESPONSIBILITY. A STATEMENT ON THIS ACTION WAS PUBLISHED IN THE JOURNAL, DEC 4, 1943, P 900. FOR THE BENEFIT OF THOSE WHO MAY WISH CONVERSION TABLES, THE FOLLOWING DATA ARE PRESENTED. THESE WILL BE REPRODUCED IN THE FRONT OF THE COUNCIL'S PUBLICATIONS. A LIMITED NUMBER OF REPRINTS WILL BE AVAILABLE AT THE COUNCIL'S OFFICE.

AUSTIN E. SMITH, M.D., Secretary.

TABLES OF APPROXIMATE EQUIVALENTS OF DOSES, APOTHECARIES' AND METRIC SYSTEMS

Weights

Apothecary or Troy	Metric	Apothecary or Troy	Metric
1 ounce = 30 grams (Gm)		$\frac{1}{2}$ grain = 45 milligrams (mg)	
4 drams = 15 grams (Gm)		$\frac{1}{4}$ grain = 32 milligrams (mg)	
$2\frac{1}{2}$ drams = 10 grams (Gm)		$\frac{3}{4}$ grain = 24 milligrams (mg)	
2 drams = 8 grams (Gm)		$\frac{1}{2}$ grain = 22 milligrams (mg)	
75 grains = 5 grams (Gm)		$\frac{1}{4}$ grain = 16 milligrams (mg)	
1 dram = 4 grams (Gm)		$\frac{1}{8}$ grain = 11 milligrams (mg)	
45 grains = 3 grams (Gm)		$\frac{3}{8}$ grain = 8 milligrams (mg)	
30 grains = 2 grams (Gm)		$\frac{1}{10}$ grain = 6.5 milligrams (mg)	
15 grains = 1 gram (Gm)		$\frac{1}{12}$ grain = 5.4 milligrams (mg)	
10 grains = 0.65 gram (Gm)		$\frac{1}{16}$ grain = 4 milligrams (mg)	
$7\frac{1}{2}$ grains = 0.5 gram (Gm)		$\frac{1}{20}$ grain = 3.2 milligrams (mg)	
7 grains = 0.45 gram (Gm)		$\frac{1}{32}$ grain = 2 milligrams (mg)	
6 grains = 0.4 gram (Gm)		$\frac{1}{64}$ grain = 1 milligram (mg)	
5 grains = 0.32 gram (Gm)		$\frac{1}{100}$ grain = 0.65 milligram (mg)	
4 grains = 0.25 gram (Gm)		$\frac{1}{120}$ grain = 0.54 milligram (mg)	
3 grains = 0.2 gram (Gm)		$\frac{1}{160}$ grain = 0.4 milligram (mg)	
$2\frac{1}{2}$ grains = 0.16 gram (Gm)		$\frac{1}{210}$ grain = 0.3 milligram (mg)	
2 grains = 0.13 gram (Gm)		$\frac{1}{250}$ grain = 0.26 milligram (mg)	
$1\frac{1}{2}$ grains = 0.1 gram (Gm)		$\frac{1}{320}$ grain = 0.2 milligram (mg)	
1 grain = 65 milligrams (mg)		$\frac{1}{410}$ grain = 0.1 milligram (mg)	
$\frac{3}{4}$ grain = 50 milligrams (mg)			

Liquid Measures

Apothecary	Metric
1 pint = 480 cubic centimeters (cc)	
12 fluid ounces = 360 cubic centimeters (cc)	
8 fluid ounces = 240 cubic centimeters (cc)	
$6\frac{3}{4}$ fluid ounces = 200 cubic centimeters (cc)	
4 fluid ounces = 120 cubic centimeters (cc)	
$3\frac{3}{4}$ fluid ounces = 100 cubic centimeters (cc)	

2 fluid ounces = 60 cubic centimeters (cc)	
$1\frac{1}{2}$ fluid ounces = 50 cubic centimeters (cc)	
1 fluid ounce = 30 cubic centimeters (cc)	
$\frac{3}{4}$ fluid ounce = 25 cubic centimeters (cc)	
$5\frac{1}{2}$ fluid drams = 20 cubic centimeters (cc)	
4 fluid drams = 15 cubic centimeters (cc)	
$2\frac{1}{2}$ fluid drams = 10 cubic centimeters (cc)	
2 fluid drams = $7\frac{1}{2}$ cubic centimeters (cc)	
80 minims = 5 cubic centimeters (cc)	
65 minims = 4 cubic centimeters (cc)	
1 fluid dram = $3\frac{7}{8}$ cubic centimeters (cc)	
50 minims = 3 cubic centimeters (cc)	
45 minims = 2.8 cubic centimeters (cc)	
32 minims = 2 cubic centimeters (cc)	
30 minims = 1.8 cubic centimeters (cc)	
20 minims = 1.2 cubic centimeters (cc)	
16 minims = 1 cubic centimeter (cc)	
15 minims = 0.9 cubic centimeter (cc)	
12 minims = 0.75 cubic centimeter (cc)	
10 minims = 0.6 cubic centimeter (cc)	
8 minims = 0.5 cubic centimeter (cc)	
5 minims = 0.3 cubic centimeter (cc)	
3 minims = 0.18 cubic centimeter (cc)	
$1\frac{1}{2}$ minims = 0.1 cubic centimeter (cc)	
1 minim = 0.06 cubic centimeter (cc)	

The Council on Pharmacy and Chemistry has voted to use exclusively the metric system in any publication for which it has sole responsibility. For this reason a table of equivalents will be provided in each book for those who are familiar only with the apothecary system.

Formerly almost every country had its own system of weights and measures, a practice which resulted in much confusion. The one system which is used almost universally and exclusively in the exact sciences is the metric system, which is based on the decimal system and has for its unit the meter and the gram. Other systems still enjoying some popularity, albeit decreasing popularity, are the Apothecaries' or Troy weight, which is used in prescriptions, the Avoirdupois or Imperial Weight, which is used in commerce, and the United States Apothecaries' or Wine Measure, which is not to be confused with the British Imperial System. Examples of the denominations of each system are: Apothecaries—grain, scruple (20 grains), drachm (or dram, 60 grains) Troy ounce (480 grains or 8 drachms); Avoirdupois—grain, ounce ($437\frac{1}{2}$ grains), pound (16 ounces or 7,000 grains) and the ton (2,000 pounds); Wine Measure—minim, fluidrachm (60 minims), Fluidounce (8 fluidrachms or 480 minims), pint (16 fluidounces), quart (32 fluidounces). For fairly accurate conversion:

1 Gm = 15.43 grains	
1 Gm = 0.2572 dram	
1 Gm. = 0.03215 Troy ounce	
1 Gm = 0.03527 Avoirdupois ounce	
1 Gm. = 0.0022 Avoirdupois pound	
1 grain = 0.648 gram (Gm)	
1 grain = 64.8 milligrams (mg)	
1 dram = 3.888 grams (Gm)	
1 Troy or Apothecary ounce = 31.1 grams (Gm)	
1 Avoirdupois ounce = 28.35 grams (Gm)	
1 Avoirdupois pound = 453.6 grams (Gm)	
1 cubic centimeter = 16.23 minims	
1 milliliter = 16.23 minims	
1 milliliter = 0.2705 fluid dram	
1 milliliter = 0.0338 fluid ounce	
1 milliliter = 0.00211 pint	
1 milliliter = 0.00264 gallon	
1 minim = 0.06161 cubic centimeters (cc)	
1 fluid dram = 3.696 cubic centimeters (cc)	
1 fluid ounce = 29.57 cubic centimeters (cc)	
1 pint = 473 cubic centimeters (cc)	

This degree of exactness, however, is not usually necessary in figuring dosages, and round figures are used in the accompanying tables of approximate equivalents, which will be found more convenient for translating dosages from one system to the other. However, further approximation by the use of household units may cause greater errors; every one should remember that a minim does not necessarily equal one drop; a drop will vary with the viscosity and surface tension of the fluid and the nature of the dropping container. A teaspoon will hold from 4 cc. (1 fluid dram) to 7 cc., a dessert spoon from 9 to 14 cc., a tablespoon from 15 to 22 cc., a wine glass from 50 to 90 cc., a teacup from 125 to 240 cc. and a tumbler from 200 to 300 cc.

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SATURDAY, FEBRUARY 19, 1944

TYPHUS IN SPAIN AND LATIN AMERICA

During the Spanish civil war, food and soap were scarce in the loyalist armies but plentiful on the rebel side. Typhus occurred among loyalist soldiers and volunteers, some of whom came from countries where the disease is endemic, but did not appear among the rebel soldiers. After the war a shifting of population occurred among ex-soldiers and civilians, who returned to their homes in crowded trains or migrated to distant provinces to escape persecution. Then the present war broke out. Manpower became scarce, crops were poor and a large part of the population went to other countries. The economy of the nation collapsed, and typhus automatically appeared.

The first case occurred in Madrid in 1939, eight days after Franco's soldiers entered the town. Shortly afterward many more cases were observed in the southern provinces, where endemic foci had been recognized for a long time, and by July 1941 4,500 cases were recorded. In Madrid alone 1,500 patients were treated, with about 200 deaths. During the rest of that year and in 1942 the disease spread throughout the whole country, the overcrowded prisons being generally responsible for the appearance of new foci. Then, thanks to the strict control measures taken, the disease subsided and finally disappeared.

Clinically the disease was typical of historic typhus. The outbreaks appeared in winter and spring, the condition was exceedingly contagious, the arthropod vector was the louse, and the Weil-Felix reaction with Proteus OX 19 was strongly positive. The mortality was from 18 per cent in the Madrid outbreak to 50 per cent in that of Valladolid, and the condition was fatal among all people older than 60 years.

Little had been written about the disease in Spain; a book was needed summarizing the newer knowledge of typhus and other rickettsial diseases and describing what was learned during the epidemic. Such a book was published in 1941 by Clavero and Perez Gallardo,¹ followed two years later by another, on laboratory methods concerned with diagnosis and prophylaxis. The

second book,² officially issued by the Ministry of Public Health, is without doubt among the best ever published on the subject in any language. The authors state that the techniques described are only those which have been tested in their laboratory. Yet practically none of the known methods are omitted, and most of the numerous illustrations of the text are original.

From these books and from still other publications one learns interesting facts. Gallardo and Sanz Ibañez³ isolated four strains of rickettsias from different outbreaks and found that, contrary to what might be expected of historic typhus, fever was induced in the rat, fever and orchitis in the guinea pig, and sometimes orchitis in the rat with rickettsias frequently present. In other words, the picture was that considered typical of murine typhus. Yet, as already stated, the clinical pattern was that of historic typhus; wild rats did not prove to be infected and the arthropod vector was the louse and not the flea. The authors rightly concluded that they were dealing with an epidemic of historic typhus producing in the experimental animal the classic biologic reactions of murine typhus.

Their results may be related to those described in Mexico by Ruiz Castañeda, who only a few years ago summarized his observations in another book⁴ on the specific prophylaxis of typhus. When Mexican strains of typhus were first isolated by Ricketts, who inoculated monkeys, and by Gabino and Girard, who inoculated guinea pigs, the conclusion was reached that the Mexican and the European or historic typhus were identical. However, Mooser noted in 1928 that Mexican strains produce a disease in the guinea pig different from that induced by European strains. This was the first of a series of observations that led to the concept of the duality of the disease, the concept being upheld by the highest authority in the field, Charles Nicolle.

This conception prevailed until Castañeda,⁵ Mooser, Varela and Pilz⁶ and others pointed out the presence in Mexico of strains of typhus with characteristics of the historic strains. By animal passages, transformation of these strains into murine strains was obtained.

From all these facts the conception of the fundamental unity of the typhus rickettsia emerges again. Like so many other infectious agents, notably filtrable viruses, the causative rickettsias would be endowed with definite power to undergo variations which result in adaptation to other hosts. Some workers⁴ have advanced the hypothesis that murine rickettsias from rat fleas infect men, and by serial transmission from man to man by lice the rickettsias vary from the original murine endemic type and become transformed into rickettsias of historic epidemic type. Utilizing these facts and comparable data from other rickettsial dis-

2. Clavero, G., and Perez Gallardo, F.: *Técnicas de laboratorio en el tifus exantemático*, Madrid, 1943.

3. Gallardo, E., and Sanz Ibañez, J.: *Trab. del Inst. Cajal de invest. cient.* 32: 277, 1940.

4. Ruiz Castañeda, M.: *Profilaxia específica del tifo exantemático*, Mexico, 1940.

5. Ruiz Castañeda, M.: *J. Exper. Med.* 52: 195, 1930.

6. Mooser, H.; Varela, G., and Pilz, H.: *J. Exper. Med.* 59: 137, 1934.

1. Clavero, G., and Perez Gallardo, F.: *Tifus exantemático: etiología, clínica, profilaxis*, Madrid, 1941.

cases, recurrent fevers and yellow fever, Baker⁷ has recently suggested an extremely imaginative and constructive theory which he calls "the typical epidemic series," the result of the progressive acquisition of virulence by the infectious agent for different species culminating in men, starting from a natural arthropod host.

One finds in Mexico typical historic typhus, typical murine typhus and all sorts of intermediate strains. To complicate the picture still further, Bustamante and Varela⁸ have recently identified the so-called Choix fever, or Pinto's fever, in that country with Rocky Mountain spotted fever. Previously Patiño, Afanador and Paul⁹ in Colombia and Diaz and Vianna Martius¹⁰ in Brazil had shown the identity of local exanthematic conditions and Rocky Mountain spotted fever, so that the latter disease probably prevails throughout the American continent. Murine typhus has been detected in Caracas,¹¹ where 6 per cent of rats show a positive Weil-Felix reaction, and strains of rickettsias have been isolated from the brains of some.

Another important contribution from the Madrid laboratories is that by Clavero and Perez Gallardo¹² on the titration of rickettsial antibodies by the Giroud method. Taking advantage of the fact that several species of rickettsias induce typical lesions after intradermal injection, Giroud¹³ in 1938 mixed progressive dilutions of test serums with a suspension of rickettsias and studied the modification of the lesions after intradermal injection into rabbits. The Spanish authors have made extensive use of the method and have improved it. The reaction is strictly specific and is no more difficult to carry out than a simple titration of antivaccinal serums. The method should be popularized; there is little doubt that no other of the various techniques available for titration of antibodies of any sort—such as the complement fixation test—is as simple, direct and instructive as those based on the modification or suppression of an intradermal lesion.

Prophylactic measures taken during the Spanish epidemic ranged from the simplest and often the most ingenious delousing methods operating in the homes in which cases of typhus occurred to large scale vaccination, several types of vaccines being employed. Clavero and Perez Gallardo assume a noncommittal attitude with regard to the prophylactic value of the vaccines. They mention, though, that those of Weigl, Cox and Laigret have reduced the severity of the infection but have not prevented it. Gallardo, who has satisfactorily modified the Laigret vaccine, is more explicit and states that the good results of applying this vaccine have been manifested by (a) the control of new outbreaks in from thirteen to eighteen days. (b)

the benignity of the disease in vaccinated persons and (c) the improved prognosis of patients older than 60 years, with a 50 per cent survival among the vaccinated.

By the use of vaccination, the new "louse powder" and efficient delousing, typhus has been controlled in our army and navy. Epidemic typhus has not appeared among our troops in this war.

THE PRESCRIPTION OF CREAM FOR THE SICK

Under a decision promulgated by the War Food Administration the use of cream with a butter fat higher than 19 per cent is prohibited except that

a handler may deliver to or for any person or establishment engaged in the care and treatment of the sick, cream or cream products of such milk fat content and in such quantities as may be necessary for supervised medical treatment of the patients of such persons or establishment: *Provided*, That the handler is supplied with a written statement from the patient's physician or, in the case of an establishment engaged in the care and treatment of the sick, from a responsible official thereof who is a practicing physician, and such written statement shall be valid for a period of not to exceed sixty days from the date of issuance and shall specify (i) the milk fat content, (ii) the daily quantity of cream or cream product required for such use, and (iii) with regard to the necessity of such cream or cream product for supervised medical treatment.

Unfortunately these regulations have not served to restrict suitably the prescription of cream of high fat content. The available evidence indicates, for instance, that the equivalent of half a million quarts a day is reported going into heavy cream on doctors' prescriptions in New York City.

The Subcommittee on Medical Food Requirements of the Committee on Drugs and Medical Supplies of the National Research Council adopted a resolution to the effect that there are no medical indications for cream of 40 per cent butter fat content which cannot adequately be satisfied by cream of 19 per cent butter fat content. The Council on Foods and Nutrition of the American Medical Association, which has also given serious consideration to the problem, expresses the opinion that the need for this type of milk product is actually limited to conditions in which the production of dietary ketosis is desired. Presumably the one situation in which a ketogenic diet is believed to be essential at this time is epilepsy. Even in this condition, however, management by the ketogenic diet does not always have first choice because of the difficulties involved in the preparation and ingestion of a ketogenic diet and also because adequate mineral retentions are difficult to obtain with such a diet. After those epileptic patients who respond to customary therapeutic procedures have been excluded, only a few remain for whom it may be desirable to prescribe a ketogenic diet. The consultants of the Council on Foods and Nutrition suggest that prescription of such a diet should be left to the discretion of the physician. A satisfactory 3,000 calory ketogenic diet can be constructed with the use

7. Baker, A. C.: *Am. J. Trop. Med.* **23**: 559, 1943.

8. Bustamante, M. E., and Varela, G.: *Rev. del Inst. de salubridad y enfermedades tropicales* **4**: 189, 1943.

9. Patiño, L.; Afanador, A., and Paul, J. H.: *Am. J. Trop. Med.* **17**: 639, 1937.

10. Diaz, E., and Vianna Martius, A.: *Am. J. Trop. Med.* **10**: 103, 1939.

11. Briceño-Iragorry, L.: *Gac. méd. de Caracas* **50**: 187, 1943.

12. Clavero, G., and Perez Gallardo, F.: *Rev. de sanidad e higiene* **publ.**, 1942.

13. Giroud, P.: *Compt. rend. Soc. de biol.* **127**: 397, 1938.

of 1 pint of heavy cream, a 2,000 calory ketogenic diet with the use of three fourths of a pint of cream. By the use of butter and the salad oils a satisfactory ketogenic diet can be built around a half pint of 19 per cent cream.

Physicians of our country have accepted willingly innumerable special responsibilities imposed on them by the war effort. It would be unfortunate indeed if any individual physician or any group of physicians should hamper the war effort by carelessness in prescribing any of the materials for invalids for which they have been authorized to issue prescriptions.

The control of food supplies, and particularly of fats, is intimately related to the progress of the war. So important is the limitation of cream of butter fat content greater than 19 per cent that officials of the War Food Administration might well require that prescription by a physician for a product of this type for any of his patients definitely indicate the nature of the condition for which the prescription is written and that it be endorsed by such an official as the county health officer or the secretary of the county medical society. Physicians should welcome such restrictions, since a part of the responsibility and burden of the physician will then be shared by some other person in authority.

PLASMA CLOT SUTURE OF PERIPHERAL NERVES

Injuries to peripheral nerves constituted approximately 2 per cent of all injuries during the first world war,¹ and their repair is one of the most important problems in military surgery. Complete restoration of function occurs in only a minority of cases of nerve injury. Many factors may influence recovery after severed nerves have been sutured. Unfavorable results may be caused (a) by long delays, so that atrophy of end organs or muscles occurs before the proper surgical treatment is instituted, and (b) in cases in which there is extensive damage to nerves, particularly when complicated by impairment of their blood supply or infection. With regard to the surgical technic, the functional results may be influenced by the method of joining the nerve ends.

The conventional method of repairing severed nerves is by the use of thread suture, generally silk. The objections to this method of apposing nerve ends are that: 1. Strangulation of nerve fibers with subsequent fibrosis which interferes with the downgrowth of nerve fibers through the suture site may occur when the sutures are tied, since it is often impossible to confine one's stitches to the epineurium, especially in the case of small nerves with delicate connective tissue sheaths. 2. Knuckling of nerve fibers is apt to occur when the threads are tied, with resultant disturbance of proper longitudinal orientation of nerve fibers at

the suture site. 3. The difficulty in inserting the thread sutures at exactly corresponding circumferential points around the stumps may result in some torsion when the sutures are tied, so that sensory fibers may be apposed to motor fibers, with resultant functional loss of misdirected fibers.

Young and Medawar,² recognizing the need for an improved technic of nerve suture, conceived the brilliant idea of using clotted plasma instead of silk. They used cockerel plasma (fortified with additional fibrinogen) clotted by chick embryo extract. Tarlov and Benjamin³ found that autologous plasma prepared without the use of an anticoagulant (unmodified plasma) and allowed to clot spontaneously was sufficiently strong to suture the sciatic nerve of rabbits. The tissue reaction was less and the incidence of separation at the suture site was no greater than with the use of the heterologous substances and, moreover, the preparation of the autologous plasma was simpler.

The original technic of suturing nerves with plasma clot consisted in approximating the ends with jewelers' forceps, depressing the junction into the neighboring tissue to form a trough and adding the plasma and clotting agent. The forceps were withdrawn after clotting occurred. The objections to this technic were that (1) only the upper aspect of the nerve junction could be coated with plasma, (2) some movement of the forceps and nerve ends tended to occur during the several minutes required for the plasma to clot and the apposition was often unsatisfactory, and (3) unless the nerve ends could be placed in a suitable position for the plasma to pool around them the technic could not be used. These shortcomings were overcome by devising a latex mold⁴ into which the nerve ends were placed and the plasma poured. Adjustment of the nerve ends on the wire rails of the mold made it possible to obtain accurate apposition. After clotting of the plasma, the wire rails and then the mold were removed. This technic was found satisfactory both as to histologic and as to functional results unless there was some strain at the suture site, when separation tended to occur. This difficulty was overcome by following a suggestion made by Lieut. Col. R. Glen Spurling that tantalum wire tension sutures be used to eliminate the strain at the suture site and plasma clot to guarantee accurate apposition of the nerve ends.⁵

On the basis of the experimental studies, the combined tantalum wire-autologous plasma clot suture of peripheral nerves was carried out in 5 human cases.⁶ The results have proved encouraging and apparently justify further clinical trial of this technic.

2. Young, J. Z., and Medawar, P. B.: Fibrin Suture of Peripheral Nerves, *Lancet* 2:126 (Aug. 3) 1940.

3. Tarlov, I. M., and Benjamin, Bernard: Autologous Plasma Clot Suture of Nerves, *Science* 95:258 (March 6) 1942.

4. Tarlov, I. M., and Benjamin, Bernard: Plasma Clot and Silk Suture of Nerves, *Surg., Gynec. & Obst.* 76:366 (March) 1943.

5. Tarlov, I. M.; Denslow, C.; Swarz, S., and Pineles, Debora: Plasma Clot of Nerves: Experimental Technic, *Arch. Surg.* 47:44 (July) 1943.

6. Tarlov, I. M.: Plasma Clot Suture of Nerves: Illustrated Technic, Surgery, to be published.

1. Stookey, Byron, and Scarff, J. E.: Injuries of Peripheral Nerves: Military Surgical Manuals: VI. Neurosurgery and Thoracic Surgery, Philadelphia, W. B. Saunders Company, 1943.

Current Comment

MILK BORNE IMMUNITY

A striking new example of mammary transmission of acquired specific immunity is reported by Berry and Slavin¹ of the University of Rochester School of Medicine. The transfer of humoral antibodies from mother to young by the mammary route was first demonstrated by Ehrlich.² Mice born of mothers immune to certain toxic proteins are highly resistant to the same toxins if nursed by their own mothers but are almost wholly nonresistant if foster nursed by nonimmune mothers. Vaillard³ confirmed these observations. He found that tetanus antitoxin administered after parturition to lactating mothers would confer an effective antitetanus immunity on breast fed young. Practical interest in milk borne immunity was increased by the later demonstration⁴ that in domestic cattle the apparently hereditary transmission of natural immunity to environmental saprophytes is dependent on an initial colostrum feeding, the subsequent milk being deficient in the necessary antibodies. An initial feeding with normal cow serum, however, can be substituted for the necessary colostrum feeding. Culbertson⁵ has recently demonstrated that transfer of active or passive maternal immunity to *Trypanosoma duttoni* also occurs chiefly after birth. Berry⁶ noted that mice at the age of 2 weeks are uniformly susceptible to intranasally instilled herpes virus. The virus regularly invades the central nervous system by way of the trigeminal and olfactory nerves, with almost uniformly fatal results. Adult mice are readily immunized against herpes virus and are then totally refractory to intranasally instilled virus. Berry found that young mice born of such hyperimmune mothers are in turn immune to standard doses of the virus administered intranasally. In order to determine the nature of this apparently hereditary immunity the Rochester investigators studied the effects of foster feeding. They found that mice born of immune mothers and nursed from birth by normal (nonimmune) mothers were fully susceptible to the herpes virus. Out of 25 young mice thus foster fed only 2 survived the routine intranasal test dose (mortality 92 per cent), while 21 control mice born of susceptible mothers and foster nursed by immune mothers were all refractory to the same test dose (mortality nil). On cessation of the immunizing foster feeding the lacteal immunity thus conferred gradually decreases, the young mice becoming normally susceptible in about three weeks. Berry concludes from these observations that the immunity to herpes virus exhibited by the progeny of hyperimmune female mice is the result of passive transfer of humoral antibodies in breast milk, intrauterine transfer of antibodies being a negligible factor in this animal species. Extension of the theory of milk borne immunity to include certain virus diseases has numerous important clinical implications.

NUTRITION IN PUERTO RICO

A recent investigation of the nutritional problems of Puerto Rico¹ discloses that a large percentage of the population exhibits a varying degree of vitamin A deficiency. Biophotometric study of 267 persons taken from the general population revealed that all except 8 had a low dark adaptation curve. In a great majority (81 per cent) of a group of 116 persons, most from the upper economic classes of Puerto Rico, gross examination of the eye revealed conjunctival manifestations of avitaminosis A such as Bitot's spot, increased vascularization, prexerosis and pigmentation. Undoubtedly particular alimentary habits, partly dependent on economic factors, have much to do with the occurrence of a generalized chronic condition of vitamin A subnutrition, in itself an index of the general undernutrition or malnutrition of the population. This may be better illustrated by comparing the average daily ration in the United States with that in Puerto Rico. Dairy products constitute only 10.5 per cent of the daily ration for Puerto Rico as compared to 25 per cent of the daily ration for the United States. Meats and fish make up 4.8 per cent of the Puerto Rican diet and 10 per cent of the North American diet. Green and leafy vegetables form 13 per cent of the diet in the United States and only 5.8 per cent in that of Puerto Rico, while eggs make up 25 per cent of the former and only 0.4 per cent of the latter. Starchy vegetables and cereals, mainly rice, constitute about 50 per cent of the diet in Puerto Rico, whereas in the United States they make up about 25 per cent of the daily ration. On this dietary regimen it should not be difficult to predict the finding of severe nutritional deficiencies in the population of Puerto Rico. Suarez makes a number of practical suggestions to provide a prompt correction of such conditions, such as the organization of an extensive campaign to raise more vegetables and consume more dairy products, the industrialization of shark liver oil and the maintenance of a cafeteria with at least one meal of high nutritional value for industrial and agricultural workers.

NEGRO CENTER FOR MATERNAL CARE

A new maternity center for Negro patients, operated by Negro professional groups under white supervision, has been organized near Birmingham.¹ Slossfield, as it is called, has developed into an important teaching center for Negro physicians and nurses. Already it has served to raise the standards of obstetric and neonatal care given by these two professional groups not only in the center itself but in private practice outside. Both maternal and neonatal mortality have shown a striking reduction. The influence of this endeavor will be widely felt; similar ventures may well be initiated and supported in the North as well as in the South, so that maternal care for Negroes may be elevated to that of the rest of the community.

1. Berry, G. P., and Slavin, H. B.: *J. Exper. Med.* **78**: 305, 315 (Oct.) 1943.

2. Ehrlich, Paul: *Ztschr. f. Hyg. u. Infektionskr.* **12**: 183, 1892.

3. Vaillard, L.: *Ann. Inst. Pasteur* **10**: 65, 1896.

4. Smith, Theobald, and Little, R. B.: *J. Exper. Med.* **51**: 473, 483 (March), 519 (April) 1930.

5. Culbertson, J. T.: *J. Immunol.* **38**: 51 (Jan.) 1940.

6. Berry, G. P., and Slavin, H. B.: *J. Bact.* **39**: 66 (Jan.) 1940.

1. Suarez, R. M.: *Studies of the Nutritional Problem of Puerto Rico, Puerto Rico J. Pub. Health & Trop. Med.* **19**: 62 (Sept.) 1943.

1. Boulware, T. M., and Stewart, R. C.: *A Negro Demonstration Center for Maternal and Newborn Care in Alabama, South. M. J.* **36**: 784 (Dec.) 1943.

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeons General of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war, and such other information and announcements as will be useful to the medical profession.

ARMY

CAPT. NORMAN FRIEDMAN AWARDED DISTINGUISHED SERVICE CROSS

Capt. Norman Friedman, formerly of Hattiesburg, Miss., has been awarded the Distinguished Service Cross "for extraordinary heroism in the face of intense enemy fire on New Georgia Island." The award was made by order of the commanding general of the armed forces in the South Pacific at a ceremony held within the perimeter of the Empress Augusta Bay beachhead on Bougainville Island. Dr. Friedman was cited for his actions on New Georgia Island, where during the battle for Munda air field he was exposed to enemy fire in an effort to give medical assistance to wounded men. On Dibela Hill he was struck and momentarily stunned by shell fragments as he advanced to the aid of a casualty. He continued forward, reached a mortally wounded officer, and then went to the aid of men in the vicinity who were less seriously injured. He succeeded in reaching another officer and, after treating him, directed his evacuation. In the same fire-swept area, he treated and directed the evacuation of a number of wounded from another regiment.

Dr. Friedman was recently appointed assistant regimental surgeon for the infantry regiment of which he is a part. He has seen service on Guadalcanal and Bougainville. In addition to his other duties, he assisted in the making of training films concerning medicine in combat. These films were made almost within view of the enemy, thus assuring an accurate documentary record of the treatment of casualties in the field.

Dr. Friedman graduated from the University of Berne, Switzerland, in 1935 and entered the service in October 1940.

ASSIGNMENT OF SPECIALLY QUALIFIED OFFICERS TO GENERAL HOSPITALS

Army Service Forces Circular No. 30, issued January 26, part 3, contains information concerning the assignment of specially qualified officers to general hospitals, stating that, to the maximum extent practicable, officers of company grade who have been wounded in action, are classified limited service, are superior in leadership and are physically and mentally suited to such duties will be assigned to duty with detachments composed of convalescent patients, especially battle casualties, who are in convalescent reconditioning sections of general hospitals. The primary duty of these officers will be to assist the officer in charge in administrative details and in the military and physical reconditioning of these patients. It is not intended that they replace M. A. C. officers. Not more than one such officer will be assigned to each hundred trainees in the described detachments. It is strongly recommended that no officer be assigned to these detachments unless he is considered qualified by the service command surgeon.

NURSE A PRISONER OF WAR

A letter was recently received by the father of Lieut. Ruby G. Bradley, Army Nurse Corps, written from a civilian internment camp in the Philippines, where she is being held a prisoner of war. Lieutenant Bradley, who was stationed at Walter Reed Hospital, Washington, D. C., before being sent to the Philippines in 1939, was acting chief nurse at Camp John Hay, Baguio, Philippine Islands, at the outbreak of the war. She graduated from Philadelphia General Hospital in 1933 and enlisted in the Army Nurse Corps in 1935.

CIVILIAN PHYSICIANS MAY OBTAIN RECORDS OF ARMY PATIENTS

Commanding officers of hospitals are now authorized to furnish clinical and professional records of former patients to practicing physicians who may need them for subsequent treatment. A recent change in Army Regulation 40-590 provides that "The commanding officer is authorized to furnish information from clinical and other professional records of patients who have been treated or are receiving treatment in hospital directly to the following: to practicing physicians such professional information as is required by them in the treatment of any member or former member of the military service."

NOMINATE FOUR BRIGADIER GENERALS IN MEDICAL CORPS

Among the forty-two temporary promotions to brigadier generals recently announced by the President, the following were in the Army Medical Corps: Brig. Gen. Joseph I. Martin, Chicago; Brig. Gen. Earl Maxwell, Fort Leavenworth, Kansas; Brig. Gen. Guy B. Denit, Salem, Va.; Brig. Gen. Edgar E. Hume, Frankfort, Ky.

PRISONER OF WAR

Word was recently received from Major Willard H. Waterous of Manila that he is being held a prisoner of war in Military Prison Camp No. 3, Manila, P. I., and that since the fall of Bataan and Corregidor he has been taking care of military prisoners of war. Dr. Waterous made his home in Manila for nearly twenty-five years. He joined the army when war was declared, underwent the bombardment of Manila on Dec. 27, 1941 and when the city was occupied by the Japanese on Jan. 2, 1942 retreated with General MacArthur's forces to Bataan Peninsula, which withstood terrific attacks before falling, April 9, 1942. Dr. Waterous graduated from Northwestern University School of Medicine, Chicago, in 1916.

ARMY PERSONALS

1st Lieut. Silvio Del Chicca, formerly of Chicago, recently was transferred from the station hospital at Fort Benjamin Harrison, Indiana, to the Army Service Forces Depot in Columbus, where he will assume his duties as assistant depot surgeon. Dr. Del Chicca graduated from the University of Florence, Italy, in 1927 and entered the service Oct. 7, 1943.

Lieut. Col. Frank C. Svoboda, formerly of San Diego, Calif., has been appointed commanding officer of the station hospital at Lake Charles Army Air Field, Lake Charles, La., succeeding Lieut. Col. James H. Dameron, who was recently transferred. Dr. Svoboda graduated from Creighton University School of Medicine, Omaha, in 1925 and entered the service in August 1941.

Capt. Jean Henderson, formerly of Stamford, Conn., is the first woman physician from that state to be commissioned in the armed forces in the Medical Corps of the Army. It is reported that she has recently been assigned to the station hospital at Fort Knox, Kentucky. Dr. Henderson graduated from Columbia University College of Physicians and Surgeons, New York, in 1931 and interned at Bellevue Hospital. Before entering the Army Dr. Henderson was a member of the pediatric service, Stamford Hospital.

NAVY

**LIEUT. COMDR. MILES C. KREPELA
AWARDED LEGION OF MERIT**

Lieut. Comdr. Miles C. Krepele, formerly of New York City, has been awarded the Legion of Merit. The citation accompanying the award is as follows: "For exceptionally meritorious conduct in the performance of outstanding services to the Government of the United States as Senior Medical Officer attached to a Defense Battalion operating against enemy Japanese forces in the New Georgia Area during the early stages of that campaign in July 1943. Stationed with his medical staff on Rendova Island at a point which was the chief target for enemy bombers, Lieutenant Commander Krepele gallantly refused to be moved to a safer area and remained to care for the wounded who were being brought in from the beach. Owing to the extreme shortage of doctors and corpsmen in that dangerous area he worked day and night for seven days, skillfully directing his limited medical personnel and assisting in the treatment and evacuation of our wounded troops. By his great courage and tireless devotion to duty he was an inspiration to his staff and patients and undoubtedly saved many lives which otherwise might have been lost." Dr. Krepele graduated from McGill University Faculty of Medicine, Montreal, in 1930 and entered the service in June 1940.

**LIEUT. FERRALL H. MOORE AWARDED
LEGION OF MERIT**

The Bureau of Naval Personnel Information Bulletin recently announced the award of the Legion of Merit to Lieut. Ferrall H. Moore. The citation accompanying the award read: "As medical officer in charge of the evacuation of casualties at Henderson Field, Guadalcanal, from Nov. 30, 1942 to Feb. 4, 1943 Lieutenant Moore instituted a plan which facilitated the loading and evacuation of patients. His efficiency in handling aircraft flight crews, sick and wounded made possible the transfer of several hundred men to base hospitals by air without a fatality en route." Dr. Moore graduated from the University of Nebraska College of Medicine, Omaha, in 1932 and entered the service June 4, 1942.

**ARMY SILVER STAR GIVEN TO
NAVY DOCTOR**

Lieut. James F. Regan, commanding officer of a navy medical detachment serving with a marine raider battalion, was recently presented with the Army Silver Star for gallantry in action on New Georgia, Solomon Islands, during the operations against the enemy there last July. The citation accompanying the award read in part as follows: "Dr. Regan directed the activities in the care of and aided the evacuation of over 200 casualties, including 72 litter (stretcher) cases, in areas covered by enemy small arms, machine gun and mortar fire during the period from July 8 to July 21." Dr. Regan graduated from the University of Chicago Department of Medicine in 1934, and entered the service in July 1942.

**ADMIRAL WILLIAM F. HALSEY PRAISES
TWO NAVAL MEDICAL CORPS
OFFICERS**

Lieut. John N. Marquis, formerly of Charleston, W. Va., was cited by Admiral William F. Halsey, U. S. Navy, for courageous conduct during the landing on Treasury Island on October 1943. The citation read as follows: "For meritorious performance of duty while serving as a medical officer on board a tank landing ship during the initial landing on Treasury Island Oct. 27, 1943. Lieutenant Marquis distinguished himself by his foresight and efficient planning for the care of the wounded during the operation. He stayed with the wounded and gave first aid under extremely adverse circumstances. Later, he performed many major operations on the seriously wounded for a period of forty-eight hours with little rest, during which time his ship was under enemy fire from the

beach and later attacked by enemy planes as they were retreating. His courageous conduct was in keeping with the highest traditions of the United States Naval Service."

Lieut. Comdr. Tracy D. Cuttle, formerly of Philadelphia, and Dr. Marquis were praised for their remarkable ingenuity during the landing on Treasury Island just prior to the attack on Bougainville. By cutting holes in the deck of their ship, they were able to lower the wounded into wards that had been set up around an emergency operating room. This made it unnecessary to transfer equipment to the beachhead and at the same time afforded means of treating the wounded en route to a hospital. Dr. Marquis and Dr. Cuttle performed fifteen major operations and administered 120 units of blood plasma in a forty-six hour period while the ship was under way. Dr. Marquis and Dr. Cuttle graduated from the University of Pennsylvania School of Medicine, Philadelphia, in 1931 and 1935 respectively. Dr. Marquis entered the service May 20, 1942 and Dr. Cuttle Dec. 8, 1941.

**COMMANDER OF U. S. S. MINNEAPOLIS
PRAISES MEDICAL OFFICER**

A recent release from the Navy Department stated that Rear Admiral Charles E. Rosendahl, former commander of the U. S. S. *Minneapolis*, commended Lieut. Harry R. Walker, U. S. Navy Medical Corps, and his assistants for their work in treating the injured on board the *Minneapolis* during the battle which took place off Guadalcanal on Nov. 30, 1942. The thirty-five men most seriously injured were transferred to a hospital ashore at Tulagi, and not 1 case transferred required further operative treatment. Every injured casualty aboard the *Minneapolis* recovered. Dr. Walker graduated from the University of Louisville School of Medicine in 1939 and entered the service Aug. 11, 1941.

**LIEUT. COMDR. MARION T. MARTIN AWARDED
SILVER STAR MEDAL**

Lieut. Comdr. Marion T. Martin, formerly of Washington, D. C., was recently awarded the Silver Star Medal. The citation accompanying the award read as follows: "Lieut. Comdr. Marion T. Martin (MC), U.S.N.—to provide medical attention for wounded personnel being evacuated from Guadalcanal by air, Lieutenant Commander Martin initiated a service to care for casualties en route and voluntarily accompanied evacuees on numerous flights through hostile skies in unarmed and unprotected transport planes. During frequent periods of heavy bombardment by Japanese warships he worked his way across heavily shelled areas to relieve suffering men." Dr. Martin graduated from the University of Tennessee College of Medicine, Memphis, in 1939 and entered the service after the completion of his internship in 1941.

**LIEUT. JOHN B. CLEMENT RECEIVES
PURPLE HEART AWARD**

Lieut. John B. Clement, formerly of Beverly and Trenton, N. J., now serving in the Navy Medical Corps, has received the Purple Heart and a commendation for "bravery under enemy fire." Dr. Clement was a graduate of the Medical College of Virginia, Richmond, in 1933 and entered the service Feb. 22, 1943.

PERSONAL

Dr. Elizabeth G. Sunners of Long Island City, N. Y., is the first woman member of the Medical Society of the County of Queens to enter any of the branches of military service. She was recently commissioned an officer in the SPARS with the rank of lieutenant commander and has been ordered to Long Beach, Calif., for active duty. Dr. Sunners graduated from the University of Vermont College of Medicine, Burlington, in 1930.

MISCELLANEOUS

TWENTY-ONE WAR SESSIONS TO BE
HELD BY AMERICAN COLLEGE
OF SURGEONS

The American College of Surgeons, Chicago, selected twenty-one cities distributed throughout the United States and Canada as headquarters for one day war sessions to be held from February 28 to April 27. The meetings will be open to the profession at large, including medical officers of the Army and Navy, residents, interns, medical students and executive personnel in hospitals. For the latter, special hospital conferences, to be held simultaneously with the scientific sessions, are being arranged. Those who plan to attend the war sessions may select the meeting which in time or place is most convenient, regardless of the states and provinces, which, for the purposes of organization, are designed on the schedule as participating in a given meeting. Representatives of the United States Army, Navy, Public Health Service, Veterans Administration, Procurement and Assignment Service and the Office of Civilian Defense have been assigned to participate in the meetings. In Canada the corresponding agencies are also assigning official representatives. Experiences of medical officers who have been on active duty in combat zones will be especially featured. In the hospital conferences such agencies as the War Production Board, the War Manpower Commission, the American Red Cross and groups interested in student nurse recruitment will be represented.

The schedule for the meetings is as follows:

Date	City	States and Provinces	Headquarters
Feb. 28	Winnipeg	Manitoba, Saskatchewan	The Fort Garry
March 2	Minneapolis	Minnesota, North Dakota, South Dakota	Hotel Nicollet
March 4	Des Moines	Iowa, eastern Nebraska, Missouri	Hotel Fort Des Moines
March 6	Chicago	Illinois, Wisconsin	The Stevens
March 8	Cincinnati	Ohio, Kentucky, Indiana, West Virginia, Tennessee	Netherlands Plaza
March 10	Detroit	Michigan	Hotel Statler
March 13	Rochester	New York State	Seneca Hotel
March 15	Toronto	Ontario	Royal York Hotel
March 17	Montreal	Quebec, New Brunswick, Nova Scotia, Prince Edward Island, Newfoundland	Mount Royal Hotel
March 20	Springfield	Massachusetts, Maine, New Hampshire, Vermont, Rhode Island, Connecticut	Hotel Kimball
March 22	Philadelphia	Pennsylvania, New Jersey, Delaware	The Bellevue-Stratford
March 24	Baltimore	Maryland, District of Columbia, Virginia, North Carolina	Lord Baltimore Hotel
March 27	Jacksonville	Florida, Georgia, Alabama, South Carolina	The George Washington
March 31	San Antonio	Texas, Louisiana, Mississippi, New Mexico, Mexico	The Gunter Hotel
April 4	Tulsa	Oklahoma, Kansas, Arkansas	The Mayo
April 7	Denver	Colorado, Wyoming, Western Nebraska	Shirley-Savoy Hotel
April 11	Salt Lake City	Utah, southern Idaho	Hotel Utah
April 14	Spokane	Washington, northern Idaho, Oregon, Montana	Davenport Hotel
April 18	Vancouver	British Columbia, Alberta	Hotel Vancouver
April 24	San Francisco	Northern California, Nevada	Hotel Mark Hopkins
April 27	Los Angeles	Southern California, Arizona	The Biltmore Hotel

SCARCITY OF SOAP AND PHARMACEUTICALS IN BELGIUM

Information received from the National War Fund, New York City, through its member agency, the Belgian War Relief Society, states that conditions in occupied Belgium are such that doctors and surgeons in hospitals there must wash their hands with a soap substitute made of clay, ordinary soap being scarce. In the black market, however, soap sells for 60 francs a kilogram (about 87 cents a pound). It was further stated that in Belgium today bandages and dressings, washed and sterilized, have to be used over and over again, since the occupation authorities have commandeered all available supplies. Iodine and petrolatum are unobtainable, and certain surgical instruments and syringes have become very scarce.

HOSPITALS NEEDING INTERNS
AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their house staff quotas allotted by the Procurement and Assignment Service:

(Continuation of list in THE JOURNAL, February 12, p. 446)

NEW JERSEY

Monmouth Memorial Hospital, Long Branch. Capacity, 215; admissions, 6,431. O. N. Auer, Director (3 interns).

OHIO

St. Thomas Hospital, Akron. Capacity, 148; admissions, 5,592. Sister M. Eleanor, Superintendent (intern, assistant resident, April 1).

MILITARY DEATHS OF BELLIGERENTS
IN 1943

In the present war, military death losses in action for all belligerents amounted to approximately 2,000,000 in 1943, according to a recent release by the Metropolitan Life Insurance Company, New York. Statisticians say that the year 1943 was the second year in succession to show a military death toll of 2,000,000, and the third in which it was on a scale comparable to that of the first world war. The 27,000 American military death losses include deaths among the wounded and an allowance for probable deaths among those now listed as missing. They do not include, however, deaths of Americans in axis prison camps, of which several thousand have been reported. U. S. military death losses were about double those of 1942. There was a sharp shift in comparative losses between the Army and Navy—the army battle fatalities were about double those of the Navy (including the Marines and Coast Guard) in 1943, while in 1942 the Navy losses were larger.

Japanese battle deaths in 1943 were estimated to be over 100,000, considerably less than in 1942. The total German losses in 1943 exceeded those in either of the two preceding years, the estimated total being 850,000 and perhaps more than a million. For the first time they exceeded Russian losses, which for 1943 were probably about 600,000. The losses of the countries of the British Empire rose in 1943 to an estimated figure of 75,000 lives. Total losses for other belligerents in 1943 were reported to be considerable, and although Italy was knocked out of the fighting late last summer more than 50,000 Italian soldiers and sailors were killed in battle in 1943. Rumania's losses were reported to be as high as 50,000. Battle deaths of the Chinese were estimated to be between 25,000 and 50,000. Yugoslavs also lost heavily in their guerrilla fighting against the axis, while French units in the military forces of the United Nations lost about 3,000 men.

HEALTH UNDER HITLER

According to *Vocher* (Bulgaria) of Oct. 8, 1943 the Chief Public Health Directorate, wishing to increase the reserve stocks of quinine for those suffering from malaria, has imported larger quantities of proquinine, containing 47.5 per cent cinchonine, 47.5 per cent of cinchonidine and 5 per cent of quinine. The action of the proquinine is identical with that of quinine. The two drugs can be used together in the ratio of 2:1. The directorate advises doctors to prescribe proquinine instead of quinine.

DNB (for Europe) November 1 (Poland) reports from Cracow: The fight against epidemics takes a prominent place in the medical attention given to the Polish and Ukrainian population in the general government. Since the general government was set up, more than one hundred hospitals for epidemic diseases have been established to combat typhus (fleckfeber). Numerous delousing institutes were constructed and more than one thousand mobile decontamination chambers (entwesungskammern) were sent to the general government from Germany.

ORGANIZATION SECTION

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status.—S. 1509 has been reported to the Senate with recommendation that it pass, providing for the education and training of members of the armed forces and the Merchant Marine after their discharge or conclusion of service. Such education and training may be given in public or private elementary, secondary and other schools furnishing education for adults, business schools and colleges, scientific and technical institutions, colleges, vocational schools, junior colleges, teachers' colleges, normal schools and professional schools and universities. Provision is made too for apprentice or other training on the job. H. R. 1506 has passed the House, proposing further to amend the Pay Readjustment Act of 1942. This bill, among other things, would permit service in the Medical Reserve Corps to be counted for pay purposes. H. J. Res. 208 has passed the House and Senate and has been transmitted to and approved by the President. This law, in making appropriations to assist in providing a supply and distribution of farm labor for the calendar year 1944, authorizes the furnishing of health and medical services to (a) agricultural workers and their families housed in any labor supply center operated as a part of the program or (b) migratory agricultural workers and their families who, without recruitment or assistance of any government agency, have entered the area served by any such labor supply center and are engaged in agricultural work in such area and to whom adequate health and medical services are not otherwise available.

Bills Introduced.—The President has transmitted to the Congress supplemental estimates of appropriation for the Federal Security Agency in the amount of \$3,200,000 to be used to complete for the present fiscal year the current nurse training program. Another supplemental estimate for the Federal Security Agency, in the amount of \$11,350,000, has been transmitted to the Congress by the President, for additional grants to states for old age assistance. The President too has transmitted to the Congress drafts of proposed legislation (1) to authorize the transfer of necessary funds from the 1944 appropriations of the War and Navy departments to defray costs to be assumed by the Selective Service System with respect to the transportation of registrants in connection with preinduction physical examinations and (2) to authorize the Selective Service System to pay for emergency medical and hospital treatment and the transportation and burial of the remains of registrants when such expenses arise while registrants are under orders of the Selective Service System.

STATE MEDICAL LEGISLATION

Kentucky

Bills Introduced.—H. 213 proposes that any county containing a city of the second class may by joint action of the fiscal court of the county and the legislative body of the city establish a city-county health department to be governed by a city-county board of health. H. 234, to amend the law relating to the state board of health, proposes that the board shall consist of the commissioner of health and eight members appointed by the governor. Of the members of the board, the bill provides, one must be a registered pharmacist, one a homeopathic physician, one an eclectic physician, one an osteopath and the remainder nonsectarian physicians. H. 259, to amend the narcotic drug act, proposes so to define narcotic drugs within the meaning of that act as to include isonipheacine, which the bill states is "the substance identified chemically as 1-methyl-4-phenyl-piperidine-4-carboxylic acid ethyl ester, or any salt thereof by whatever trade name identified."

Mississippi

Bills Introduced.—S. 126 proposes to condition the issuance of a license to marry on the presentation by each party to the proposed marriage of the certificate of a licensed physician that he has within thirty days prior to the date of application for a license examined the applicant and has caused stated laboratory examinations to be made to ascertain the presence of venereal disease. If the presence of venereal disease is ascertained the examining physician shall issue his certificate only after both parties to the proposed marriage are notified of the presence of such venereal disease and only after the applicant having the venereal disease has been administered such treatment as is prescribed by the state board of health. S. 130, to supplement the medical practice act, proposes to authorize the state board of health to license without examination all bona fide residents of the state who have served as physicians in the armed forces of the United States and who have not been able to apply for licenses and take examinations since graduating from accredited medical schools. H. 252 proposes to authorize the establishment and operation of a North Mississippi State Charity Hospital and Nurses' Home to be located in or near the city of Tupelo, Lee County. H. 265, H. 266 and H. 267 propose to appropriate \$100,000 for the establishment and maintenance of a separate department at the Mississippi State Hospital at Whitfield for the treatment of neurosyphilis or other diseases leading to insanity. H. 269 proposes to authorize the establishment and maintenance of a Central Mississippi State Charity Hospital and Nurses' Home to be located in or near the city of Carthage, Leake County. House Concurrent Resolution 27 proposes to create a joint committee of four members of the House and three members of the Senate to make a study of workmen's compensation laws with a view of making recommendations to the 1946 session of the legislature. H. 270 and H. 271 propose to enact an act to provide for the payment of compensation for injuries to or death of employees arising out of employment.

New York

Bills Introduced.—S. 589 and A. 813 propose to enact a separate chiropractic practice act and to create an independent board of chiropractic examiners to examine and license applicants for licenses to practice chiropractic, which is defined as "the science of locating and the removing of nerve interference in the human body, according to chiropractic principles, where such interference is the result of or caused by misalignment or subluxations of the vertebral column. It excludes operative surgery, the reduction of fractures, the prescription or use of drugs or medicine and the practice of obstetrics." A. 446 proposes to require hospitals to permit the performance of ritual circumcision on a male child born therein, in accordance with the Orthodox Hebrew religious requirements. A. 719, to amend the workmen's compensation act, proposes to permit an injured employee when dental care is required to select any dentist to treat him who is authorized to do so. A. 740, to amend the workmen's compensation act, proposes that every employee mentally disabled as the result of an industrial accident shall be entitled to receive, without any deductions from the amount of compensation payable to him, medical care, maintenance and attendance in a public hospital or institution at the expense of his employer until such time as he is discharged from the hospital as cured. A. 768 proposes to provide for the hospitalization, treatment and rehabilitation of persons discharged for disability from the armed forces of the United States who have non-service connected mental disabilities and who at the time of entry into the armed forces were residents of the state and who are ineligible for hospitalization in United

States Veterans Administration facilities. S. 663, to amend the laws relating to the practice of chiropody, proposes to permit any licentiate in podiatry to use the title "doctor" or the abbreviation "Dr." if such use is qualified by the designation podiatrist and/or chiropodist.

South Carolina

Bills Introduced.—S. 783 and H. 945, to amend the uniform narcotic drug act, propose so to define narcotic drugs within the meaning of that act as to include isonipecaine, which the bill states is "the substance identified chemically as 1-methyl-4-phenyl-piperidine-4-carboxylic acid ethyl ester, or any salt thereof by whatever trade name identified."

Virginia

Bills Introduced.—S. 103 proposes to make incurable insanity a ground for divorce if the insane spouse has been continuously confined in a state or federal hospital or facility for five years or more. S. 105, to amend the workmen's compensation act, proposes to make compensable a disability arising from occupational disease, which the bill proposes to define as "a disease arising out of and in the course of the employment." The bill further provides that no ordinary diseases of life to which the general public is exposed outside of the employment shall be compensable, except when it follows as an incident of occupational disease as defined in the law.

WOMAN'S AUXILIARY

Arkansas

Members of the Southeastern Arkansas Medical Society were guests of the woman's auxiliary at their annual Christmas dinner. A letter to each of the fourteen members who are in service was signed by those present.

The Pulaski County Auxiliary had a public relations meeting recently, with Dr. Paul Eschweiler talking on the blood bank.

District of Columbia

The Woman's Auxiliary to the District Medical Society elected the following officers: Mrs. Fred R. Sanderson, president; Mrs. L. A. Martel, first vice president; Mrs. Charles H. McEnerey, second vice president; Mrs. J. Chester Brady, recording secretary; Mrs. E. J. Cummings, corresponding secretary; Mrs. Thomas Crisp, treasurer; Mrs. E. L. Morrison, parliamentarian; Mrs. Albert E. Marland, historian.

A number of auxiliary members assisted the medical society during the fifteenth annual scientific assembly in October. At the October meeting of the auxiliary \$120 was given to the Community War Fund and \$105 to purchase Red Cross Christmas boxes for American prisoners of war.

At the November meeting of the Auxiliary to the Medical Society of the District of Columbia a film, "The Last Will and Testament of Tom Smith," was shown, and a talk on "China" was given by Mr. William R. Johnson. The auxiliary made 3,000 surgical dressings and many comfort kits for the soldiers. They recently raised \$250 to be used for equipping mobile battle stations.

Florida

The Florida auxiliary recently elected the following officers: Mrs. F. W. Krueger, Jacksonville, president; Mrs. C. H. Murphy, Bartow, first vice president; Mrs. P. J. Manson, Miami, second vice president; Mrs. William H. Ball, Jacksonville, corresponding secretary; Mrs. W. C. Williams, West Palm Beach, secretary and treasurer; Mrs. J. L. Anderson, Coral Gables, historian; Mrs. L. F. Robinson, Fort Lauderdale, parliamentarian.

The Duval County auxiliary recently met at the home of Mrs. C. F. Henley, Jacksonville. Reports were given concerning work at Atlantic Beach and Camp Blanding, where auxiliary members helped furnish rooms with games and radios for the medical units.

Indiana

The board of the Indiana auxiliary met recently in Indianapolis with Mrs. James Baxter Jr., president, presiding.

Dr. Morris Fishbein, editor of THE JOURNAL, gave a talk before the Howard County auxiliary, January 18, at Kokomo.

Major Philip Rossman of the Baer Field Medical Unit spoke on "Military Medicine" at the November meeting of the Allen County auxiliary.

The Marion County auxiliary entertained at a tea at the governor's mansion. The wives of medical officers stationed at Billings General Hospital, Fort Benjamin Harrison, Camp Atterbury, and Stout Field, 125 members and guests were present.

The Vigo County auxiliary recently devoted a day sewing for Bundles for America and the Red Cross.

Iowa

The Iowa auxiliary recently elected the following officers: Mrs. W. S. Reiley, Red Oak, president; Mrs. J. C. Decker, Sioux City, president-elect; Mrs. A. G. Felter, Van Meter, secretary; Mrs. A. E. Merkel, Des Moines, treasurer. Mrs. Chapler, chairman of press and publicity for Iowa, reprinted "The Credo of the Doctor's Wife in Wartime," by Mrs. William Hibbitts of Texas. She also gave a short report of the Dallas-Guthrie auxiliary and the auxiliaries to the Pottawattamie and Montgomery county medical societies, which, with the medical societies, held a dinner meeting in Red Oak in November.

Mississippi

The executive board of the Mississippi auxiliary met in Jackson recently at the home of Mrs. H. C. Ricks, president.

Members of the Northeast Mississippi Thirteen Counties Auxiliary met recently. Dr. M. Y. Dabney talked on "The Doctor's Wife's Place in the War Effort."

Ohio

Interesting meetings were reported by the auxiliaries of the Hamilton, Highland, Knox, Ross and Lucas counties.

Virginia

The Woman's Auxiliary to the Medical Society of Virginia held its twenty-first annual meeting recently in Roanoke. Mrs. H. W. Rogers, president, Norfolk, presided at all sessions except the postconvention board meeting, at which Mrs. Clyde West, Alexandria, the newly inducted president, presided.

Officers of the Virginia auxiliary are Mrs. W. Clyde West, president, Alexandria; Mrs. Paul C. Pearson, president-elect, Turpin; Mrs. C. C. Smith, secretary, Norfolk; Mrs. N. G. Schuman, corresponding secretary, Alexandria; Mrs. Reuben F. Simms, treasurer, Richmond, and Mrs. E. Latene, chairman press and publicity, Flanagan.

OFFICIAL NOTES

DOCTORS AT WAR

Radio broadcasts of Doctors at War by the American Medical Association in cooperation with the National Broadcasting Company and the Medical Department of the United States Army and the United States Navy are on the air each Saturday at 4:30 p. m. Eastern war time (3:30 Central war time, 2:30 Mountain war time and 1:30 Pacific war time).

The titles and guest speakers for the next three programs are as follows:

February 19. "Hometown Heroes."
Speaker, James A. Paullin, M.D., President American Medical Association.

February 26. "Share and Share Alike."
Speaker, Col. Rohland A. Isker, Subsistence Research Laboratory, Chicago.

March 4. "New Life Preserver."
Speaker, Capt. W. M. Craig (MC), U.S.N.R.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Personal.—Dr. Wilton L. Halverson, Los Angeles, director of the state department of public health, has recently been appointed to the board of scientific directors of the International Health Division of the Rockefeller Foundation.

Fellowship in Pharmacology Established.—The Winthrop Fellowship in pharmacology has been established at Stanford University School of Medicine, San Francisco, for use in training doctors of medicine in teaching or research in the field of pharmacology. The fellowship is to be financed by a grant of \$1,500 from the Winthrop Chemical Company, Rensselaer, N. Y.

Physicians Needed.—Doctors of medicine are being sought by the Los Angeles County Civil Service Commission to render professional care in the treatment of patients in a county institution. Doctors under 55 years of age who have graduated with an M.D. degree from an approved medical school and who have completed at least nine months' internship in an approved hospital are urged to apply. Applicants for this \$290 to \$345 a month position must possess or be able to secure promptly a certificate to practice in California. The last day for filing of applications is Saturday, March 4. Applications and full information are obtainable from the office of the commission, 102 Hall of Records, Los Angeles 12.

DISTRICT OF COLUMBIA

New Juvenile Court Clinic.—Stanley W. Geshell, passed assistant surgeon, United States Public Health Service Reserve, has been named psychiatrist for the new Juvenile Court Clinic opened in Washington recently.

Personal.—Dr. James Ross Veal has resigned as resident chief medical officer in the department of surgery at Gallinger Municipal Hospital to enter private practice.—Dr. Edgar A. Bocock has resigned as medical superintendent of Gallinger Municipal Hospital, a position he had held for sixteen years.

FLORIDA

Personal.—Dr. Victor P. Genge, director of the Lake County Health Department, Tavares, has been appointed in charge of the Highlands-Glades Health Unit, succeeding Dr. Paul J. Coughlin, Sebring.—Dr. Harry C. Galey was recently appointed health officer of Key West.

Campaign Against Venereal Disease.—The Florida State Board of Health has been conducting a statewide educational campaign against venereal disease under the auspices of Dr. Roger F. Sondag, Sarasota, director of the division of venereal disease control. Educational features include the distribution of literature, the publishing of newspaper advertisements and radio broadcasts. In an effort to reach every home in the state, literature was distributed from house to house by civilian defense block leaders, and pamphlets were enclosed in all light and department store bills.

ILLINOIS

Society News.—The Henry County Medical Society, Kewanee, was addressed, February 10, by Dr. Donald D. M. Cook, Chicago and Lake Zurich, on "The Cook-Fuller Theory of the Cause of Gastric and Duodenal Ulcer: The Newer Concept of the Medical and Surgical Treatment of Ulcer." Dr. Cook and Dr. Muriel K. Fuller, Chicago, addressed the Peoria County Medical Society, Peoria, February 15, on the same subject.

Chicago

Cancer Forum.—"Cancer of the Stomach" will be the theme of a forum for the public, February 21, at the John B. Murphy Auditorium, under the auspices of the Chicago Cancer Committee. The speakers will include:

Dr. Ludvig Hektoen, Introductory Statement.
Dr. James P. Simonds, The Nature of the Disease.
Dr. Walter L. Palmer, Diagnosis and Symptoms.
Dr. Warren H. Cole, Treatment and Results.
Dr. Morris Fishbein, Editor, THE JOURNAL, Tracking Down the Cancer Charlatan.

Leo M. Lyons, executive director of St. Luke's Hospital, will be the moderator at the forum, which is the fifth in a series for the public sponsored by the cancer committee.

Clinical Conference.—The Chicago Medical Society will hold its first annual clinical conference at the Stevens Hotel, March 14-17. Among the speakers will be:

Dr. Walter L. Palmer, Amebiasis and Dysentery.
Dr. James T. Case, Value of X-Rays in the Study of Postoperative Emergencies and Complications.
Dr. Henry G. Poncher, The Clinical Significance of Spontaneous Hemorrhage.
Lieut. W. Allen Conroy, M. C., A. U. S., Anesthetic Emergencies.
Dr. Edward G. Waters, New York, The Use and Abuse of Cesarean Section.
Dr. Harold A. Vonachen, Peoria, Ill., The Employment of the Handicapped.
Dr. Lewis J. Pollock, War Neuroses—Their Rehabilitation and Absorption into Industry.
Dr. Willard O. Thompson, Recent Advances in Endocrinology.
Dr. Bert I. Beverly, Fears and Anxieties in Children.
Dr. Donald G. Anderson, Boston, Penicillin.
Dr. Karl D. Figley, Toledo, Ohio, This Thing Called Allergy.
Dr. Noble Sproat Heaney, Differential Diagnosis and Treatment of Ectopic Pregnancy.
Dr. Paul C. Bucy, The Management of Acute Head Injuries.
Dr. Walter C. Alvarez, Rochester, Minn., Heartburn.
Brig. Gen. Fred W. Rankin, M. R. C., Surgery of the Colon.
Drs. Louis N. Katz and James Roscoe Miller, The Clinical Aspects of Heart Block.
Lieut. Col. Worth B. Daniels, M. C., A. U. S., Meningococcic Septicemia and Meningitis.
Dr. William C. Danforth, Evanston, Ill., Management of Prolonged Labor.
Dr. Paul H. Holinger, Bronchoscopy in Pulmonary Diseases of Childhood.
Drs. Kellogg Speed and William R. Cubbins, Fractures. Dr. Speed, general principles of treatment and Dr. Cubbins, a common individual type.
Dr. Herman L. Kretschmer, Urology (title not announced).
Lieut. Comdr. David H. Rosenberg (MC), U. S. Naval Reserve, Rheumatic Heart Disease.
Dr. Frederick P. Moersch, Rochester, The Abuse of Sedatives in Medical Practice.
Col. Esmond R. Long, M. C., A. U. S., Some Aspects of the Tuberculosis Problem.
Lieut. Col. Charles M. Caravati and Capt. Robley D. Bates Jr., M. C., A. U. S., Malaria.
Dr. William J. Dieckmann, Prevention and Treatment of Eclampsia.
Dr. E. W. Alton Ochsner, New Orleans, Peritonitis.
Dr. Herman C. Schumm, Milwaukee, Trends in the Care of the Infantile Paralysis Patient.
Dr. Adolph Hartung, Obscure Abdominal Tumors: Now the Roentgen Examination Can Aid in Their Diagnosis.
Dr. Henry N. Harkins, Baltimore, Surgical and Medical Management of Burns.
Dr. Henry Close Hesseltine, Gynecologic Disorders Among Industrial Workers.
Dr. Roy G. Hoskins, Boston, The Practical Side of Endocrinology.
Dr. Roy R. Kracke, Emory University, Ga., Effects of Drugs on the Blood.
Dr. Hugo V. Hullerman, Springfield, Ill., Emergency Maternal and Infant Care—How It Affects the Doctor.
Dr. John Albert Key, St. Louis, Complications on External Fixation of Fractures.
Dr. Drew William Luten, St. Louis, Coronary Disease.
Dr. Israel Davidsohn, Chicago, Cause of Reactions in Blood Transfusions.

Diagnostic clinics will be conducted by Drs. Alexander Brunswick; Earl D. Osborne, Buffalo; Glenway W. Nethercut; Charles M. McKenna; Edward A. Oliver; I. Pat Bronstein, Herbert E. Schmitz, Janet E. Towne and James H. Mitchell. Other features of the meeting will be a surgical panel on "Blood and Blood Substitutes" by Drs. Lester R. Dragstedt, Karl A. Meyer, Sidney O. Levinson and Joseph Garrott Allen, a medical panel on "The Use of Sulfonamides in Upper Respiratory Infections" by Brig. Gen. Hugh J. Morgan, M. C., A. U. S., Dr. Italo F. Volini and Dr. William L. Winters, and a clinicopathologic conference conducted by Dr. Edwin F. Hirsch. There will also be a military program, the speakers to be announced later.

INDIANA

Hospital News.—The Welborn-Walker Hospital, Evansville, has been sold to the First Baptist Church. The hospital will be known as the Welborn-Baptist Memorial Hospital.

Personal.—Dr. Clarence A. Hartley Sr. has been appointed health officer of Evansville and Vanderburgh County.—Dr. Onis E. Brendel, Zionsville, has been appointed by Governor Schricker as chairman of the state board of beauty culturist examiners to succeed Dr. Daniel L. Bower, Indianapolis.—Dr. Oscar S. Heller, Greenfield, has resigned as health officer of Hancock County.

Meeting on Social Hygiene.—The Indianapolis Social Hygiene Association and the American Social Hygiene Association will hold a one day conference at the Claypool Hotel, Indianapolis, February 24. Among the speakers will be Drs. Thurman B. Rice, George W. Bowman, Herman G. Morgan, Norman M. Beatty, Arthur F. Weyerbacher and Hugh L. C. Wilkerson, all of Indianapolis.

Outbreak of Typhoid.—An epidemic of typhoid in eight northern Indiana counties was reported, January 28, by the state board of health. Seventy cases were reported in Miami, Kosciusko, Wabash, Huntington, Cass, White, Carroll

and Wells counties. One death occurred in Kosciusko County, February 5. In a statement to the press Dr. Thurman B. Rice, state health commissioner, is reported to have said that "we are pretty certain that it is not water, nor fluid milk, but is probably something packed and hauled into these neighboring counties. It might be cottage cheese or butter or any soft packaged food, or possibly an orange or other soft drink."

KENTUCKY

Changes in Health Officers.—Dr. Samuel L. Andelman has been appointed in charge of the Johnson County Health Department, succeeding Dr. Edward W. Kissel, resigned. Both are of Paintsville. —Dr. William G. Morgan is now director of the Clark County Health Department, Winchester. —Dr. James H. Wells, Pineville, has resigned as health officer of Bell County.

Society News.—Dr. M. Joseph Henry discussed "Intestinal Obstruction" before the Louisville Medico-Chirurgical Society, February 11. Dr. Jesse H. Simpson presented a case report on "Facial Paralysis Following Upper Respiratory Infection." —The Louisville Society of Medicine was addressed, February 3, by Dr. Richard Alexander Bate on "The Benzene Ring, Induction Current and Colloids in Cancer." —At a meeting of the Transylvania Medical Society, February 3, Dr. George W. Pedigo Jr., Louisville, spoke on "Mode of Action of the Sulfu Drugs and Clinical Evaluation of Sulfamerazine."

NEW HAMPSHIRE

Physiologist Dies.—Colin C. Stewart, Ph.D., Brown professor of physiology at Dartmouth College, Hanover, died January 22, aged 70. Dr. Stewart had been a member of the faculty since 1904. He had been Brown professor since 1908 and had served as secretary of the medical school from 1913 to 1924 and for a year in 1925 was acting dean of the school. He had at one time been on the faculty of Harvard Medical School, Boston, Columbia University College of Physicians and Surgeons, New York, and the University of Pennsylvania School of Medicine, Philadelphia. He was an honorary member of the New Hampshire Medical Society and an associate fellow of the American Medical Association.

NEW YORK

Lecture on Tropical Medicine.—Dr. Barton F. Hauenstein, Buffalo, discussed "Present and Postwar Importance of the Malaras and the Dysenteries" before the Cortland County Medical Society, Cortland, February 18. The lecture is one in a series on tropical medicine sponsored jointly by the state medical society and the state department of health.

Octogenarian Honored.—Dr. Willard T. Rivenburgh was recently honored by the Middleburg Rotary Club in observance of his eightieth birthday. Dr. Rivenburgh has practiced in Middleburg for the past fifty-six years with the exception of a six months period when he served as New York state medical school inspector. According to the state medical journal, he has been coroner of Schoharie County for about twenty-eight years. He has been health officer of the village and town of Middleburg and the towns of Fulton, Blenheim and Gilboa. He once served as president of the Schoharie County Medical Society and as president of the board of education of Middleburg.

New York City

The Duncan Bulkley Lecture.—Dr. George T. Pack presented the annual Duncan Bulkley Lecture of the New York Academy of Medicine, January 21. His subject was "Cancer of the Stomach."

Illegal Practitioner Sentenced.—Henry Horatio Thomas, alias Thamos, who describes himself as a "metaphysician and psychologist," was recently sentenced to six months in the workhouse following his plea of guilty to a charge of unlawfully practicing medicine. In an earlier case Thomas was arrested and found guilty and sentenced to six months in the workhouse. The recent sentence will commence at the termination of the first six months period. Thomas treated by massage and diet. In the earlier prosecution he treated by means of a "spectro-chrome ray machine," which was seized together with other evidence on his first arrest.

Dr. Alfred Meyer Honored.—At a special ceremony, January 27, Mount Sinai Hospital honored Dr. Alfred Meyer, oldest living graduate of its house staff and prominent for his work in tuberculosis. Dr. Meyer, who will observe his ninetieth birthday this year, was presented with a special issue of the *Journal of the Mount Sinai Hospital* containing about thirty-five articles,

most of them scientific reports, contributed by his professional associates. Speakers at the ceremony were Leo Arnstein, commissioner of welfare of New York City and president of the Mount Sinai Hospital, Dr. James Alexander Miller and Dr. Ira Cohen, president of the medical board of the hospital. Dr. Meyer was appointed to the Mount Sinai Hospital staff immediately after his graduation at Columbia University College of Physicians and Surgeons in 1877. He subsequently served as a member of the attending staff until 1919, when he retired from active service to become consulting physician.

Annual Report of Long Island College.—Gifts totaling \$97,019 were received in the year ended January 1 by the Long Island College of Medicine, Brooklyn, for eight research projects, staff expansion, scholarships, student loans and a new department of psychiatry. The psychiatric development was made possible by a six year grant from the Commonwealth Fund to strengthen the psychiatric phase of education in the medical schools of the country. Contributions of \$2,433 were received for an overseas unit, the 79th General Hospital, an all Brooklyn unit now stationed in the European war theater. A grant of \$5,000 for scholarships was received from the W. K. Kellogg Foundation, Battle Creek, Mich., to supplement an initial grant of \$10,000 to provide loans or scholarships for medical students prior to the adoption of the federal program to put "all able-bodied men in professional schools on an enlisted basis until their training is completed." In the first appeal for communitywide support for the college of medicine a total of \$43,432 was received from a group of more than 1,100 contributors. Two endowed scholarships amounting to about \$20,000 were established in 1943, the Stanley P. Jadwin and Peter Yudkowsky Memorial Scholarships. A new prize award was established through a gift of \$1,000 in memory of Robert R. Benedict, the income from which is to be awarded each year to the fourth year student who offers the best paper on the causes and treatment of any form of psychosis. The Presbyterian Hospital made a contribution of \$500 for research on the circulation of blood through the optic nerve, and the Commonwealth Fund continued its three year grant to provide visiting professors under a plan to test the feasibility of more interchange of personnel between medical colleges. The Rockefeller Foundation made a grant of \$500 for a series of lectures on problems in the distribution of medical care and the Blatt Memorial Fund was established to endow the quarterly cumulative index in the college's library. The American Medical Association gave \$250 for research work in the department of pathology. Commercial medical firms made grants for special studies as follows: E. R. Squibb & Sons, \$2,000 for research in lymphogranuloma venereum; the Upjohn Company, \$850 to defray expenses incident to clinical investigation of a surgical germicide; the Winthrop Chemical Company, \$1,200 for investigations on pneumonia; Lehn and Fink, \$2,000 for bacteriology research; the Nepera Chemical Company, \$1,200 for research in dimethylsulfadiazine; William R. Warner and Company, Inc., \$2,000 for post-graduate study, and the Heliogen Holding Company, \$5,150 for heliogen research.

TEXAS

New Professor of Pediatrics.—Dr. Arild E. Hansen, associate professor of pediatrics, University of Minnesota Medical School, Minneapolis, has been appointed as professor of pediatrics and chairman of the department of pediatrics, University of Texas School of Medicine, Galveston, and director of the University of Texas child health program under the auspices of the William Buchanan Foundation of Texarkana. The university's child health program contemplates the further development and expansion of the department of pediatrics to include research and create opportunities for practicing physicians to participate more effectively in promoting child health.

War Conference.—The Texas Hospital Association will sponsor a war conference at the Baker Hotel, Dallas, February 23-24. Among the speakers will be:

- Dr. Robert H. Bishop Jr., Cleveland, Blue Cross or Compulsory Health Insurance.
- W. S. Brines, chief hospital consultant, War Production Board, Washington, D. C., Procurement of Materials and Supplies.
- Dr. Edward H. Cary, Dallas, Plans for Expansion of Group Hospital Service in Texas.
- George Bugbee, Chicago, executive secretary, American Hospital Association, Expansion Program of American Hospital Association.
- Frank J. Walter, Denver, president, American Hospital Association, Manpower and Womanpower.
- Mrs. Dorothy Rogers Williams, R.N., Cleveland, The Director's Dilemma.
- Dr. Thomas R. Ponton, Chicago, Medical Staff and Records During and After the War.
- Dean Conley, executive secretary, American College of Hospital Administrators, The Hospital Administrator Becomes Professional Conscious.

Proposed Texas Medical Center at Houston.—A proposal has been submitted to set up a Texas Medical Center at Houston to be built on lands made available through the Anderson Foundation in the vicinity of Hermann Hospital. The suggestion was made in a memorandum prepared by Chauncey D. Leake, Ph.D., vice president and dean, University of Texas Medical Branch, Galveston, Frederick C. Elliott, D.D.S., dean, University of Texas School of Dentistry, Houston, Dr. William H. Moursund, dean, Baylor University College of Medicine, Houston, and Dr. Ernst W. Bertner, acting director of the M. D. Anderson Hospital for Cancer Research, Houston. The memorandum, which was submitted to authorities of Baylor and Texas universities, the Anderson Foundation and the Houston Academy of Medicine, recommends the establishment of a committee of representatives from each of the interests involved to coordinate plans for the proposed medical center, the committee to serve as a clearing house for the development of the center. The specific administrative units would include:

The Hermann Hospital and associated hospitals under the auspices of their respective trustees.

A medical school for the training of general practitioners under the auspices of Baylor University.

A college of nursing for the training of registered nurses under the auspices of Baylor University.

A school of dentistry for the training of general practitioners under the auspices of the University of Texas.

The M. D. Anderson Hospital, devoted to cancer research in its broadest aspects but with particular reference to the clinical handling of cancer patients, under the auspices of the University of Texas.

A school of public health (including geographic medicine) for the training of public health officials, for postgraduate and extramural instruction to doctors throughout the state of Texas in the prevention of disease, in the promotion of industrial hygiene and in control of sanitation, under the auspices of the University of Texas.

A central library, auditorium and social center under the auspices of the Houston Academy of Medicine.

GENERAL

Snow Medal Awarded to Dr. Cumming.—The William Freeman Snow Medal was presented on February 1 to Dr. Hugh S. Cumming, Washington, D. C., director of the Pan American Sanitary Bureau and formerly surgeon general of the U. S. Public Health Service, for "outstanding service in the field of social hygiene." Dr. Merritte W. Ireland, formerly surgeon general of the U. S. Army, presented the award during the annual dinner meeting of the American Social Hygiene Association. Dr. Cumming addressed the meeting on "Nations United for Health and Welfare in Peace and War," and Dr. Ray Lyman Wilbur, Stanford University, Calif., president of the association, discussed "The Future of Voluntary Agencies."

Fellows in Aviation Medicine.—The Aero Medical Association of the United States announces that the following have been chosen fellows in aviation medicine:

Dr. Walter M. Boothby, Rochester, Minn.

Comdr. David C. Gaede (MC), U. S. Navy.

Brig. Gen. Malcolm C. Grow, M. C., U. S. Army.

Col. Walter S. Jensen, M. C., U. S. Army.

Dr. Isaac H. Jones, Los Angeles.

Lieut. Comdr. Marion M. Kalez (MC), U. S. Naval Reserve.

Comdr. Wilbur E. Kellum (MC), U. S. Navy.

Dr. William Hodges McKnight, Fort Worth, Texas.

Dr. William R. Stovall, Washington, D. C.

Dr. Harold R. Bohlman, Baltimore, is president of the association, Brig. Gen. Eugen I. G. Reinartz, M. C., U. S. Army, president-elect, and Dr. David S. Brachman, Detroit, secretary-treasurer.

Society News.—The American Broncho-Esophagological Association will hold its annual meeting at the Waldorf-Astoria Hotel, New York, June 6. Dr. Paul H. Holinger, 700 North Michigan Avenue, Chicago, is the secretary.—The twenty-fifth annual meeting of the American Association for Thoracic Surgery, originally scheduled for 1942, will be held at the Drake Hotel, Chicago, May 5-6. Lieut. Col. Richard H. Meade Jr., M. C., A. U. S., Kennedy General Hospital, Memphis 15, Tenn., is the secretary.—The council of the American Association of Pathologists and Bacteriologists has voted that the scientific meeting of the association will not be held in 1944. The council will meet on or about April 8 in Cleveland. Proposals for membership must be in the office of the secretary, Dr. Howard T. Karsner, 2085 Adelbert Road, Cleveland, March 31.—The American Society for Clinical Investigation will hold its annual meeting at the Claridge Hotel, Atlantic City, N. J., May 8.—The Federation of American Societies for Experimental Biology has canceled its 1944 meeting.

Vitamin A Allocations.—On January 28 the War Food Administration announced that in 1944 civilians in the United States will receive 88 trillion U. S. P. units out of about 139 trillion U. S. P. units of the total 1944 vitamin A allocation. While this is about the same quantity that was available

for physicians in 1943, the amount is slightly more than 63 per cent of the total allocation for the year. About 5 trillion U. S. P. units will go to the U. S. military and war services. Exports and shipments to our territories, allies and other friendly nations, and a contingency reserve for emergency war purposes required about 46 trillion U. S. P. units, or 33 per cent of the allocable supplies. Allocations represent the planned division of expected supplies of food among the U. S. military and other war services, civilians, American territorial possessions, our allies and liberated areas. Requirements of each group are presented to the Food Requirements and Allocations Committee, the Civilian Requirements Branch of the Office of Distribution, WFA, representing U. S. civilians. Vitamin A has vital civilian food enrichment and pharmaceutical uses, especially for babies. About 40 trillion units of the civilian allocation will go into pharmaceutical preparations, 8 trillion units for food enrichment and the rest for feed enrichment.

Robert Hockett Named Scientific Director of Sugar Research Foundation.—Robert C. Hockett, Ph.D., associate professor of organic chemistry, Massachusetts Institute of Technology, Cambridge, Mass., has been appointed scientific director of the Sugar Research Foundation. According to the *Albany Health Bulletin* the appointment is said to be the first step "in a new and extensive scientific program to extend knowledge of the role of sugar and other carbohydrates in the human body and also of the chemical transformations to which sugars can be subjected. It is anticipated that such chemical studies, both fundamental and applied, will eventually unfold new industrial uses of sugar and its derivatives." Dr. Hockett has been granted a five year leave of absence from the Massachusetts Institute of Technology to carry on his new work with the foundation, which is a nonprofit organization with offices in New York. The foundation, which was organized in June 1943, is supported by cane sugar refiners and beet sugar processors, as well as raw sugar producers of Hawaii, Louisiana and Puerto Rico. It will sponsor research and scientific studies at universities and other research institutions on uses or potential uses of sugar and the dissemination of information uncovered by the research on sugar in its several roles. Dr. Hockett was formerly associate technologist of the National Institute of Health.

Committee on Alcoholism Established by Research Council.—The appointment of a new committee on alcoholism by the Research Council on Problems of Alcohol is one of the results of the recent reorganization of the group. Members of the committee are Drs. Lawrence S. Kubie and Thomas A. C. Rennie, New York, and Mesrop A. Tarumian, Farnhurst, Del.; Edward H. L. Corwin, Ph.D., New York; Leonard V. Harrison, LL.D., New York, and Francis T. Chambers Jr., Philadelphia, Anna Kempshall, New York, Hunter Miller, Richmond, Herbert Taylor and William Wilson, New York. Under the reorganization the research council aimed to increase its representatives on its board of directors on a regional basis. Thus far some members have been named for the eastern district, Canada, southern district, north central district and the Pacific coast district; however, these appointments are not complete. Another new feature is the appointment of an executive committee of the board of directors to give special attention to the business and financial affairs of the council. An executive committee of seven members of the scientific committee has been appointed to give closer attention to research on the treatment of alcoholism: Dr. Karl M. Bowman, San Francisco; Dr. Frank J. Curran, New York; Lawrence K. Frank, Brooklyn; Dr. Harold E. Himwich, Albany; Elvin M. Jellinek, Sc.D., New Haven, and Thorsten Sellin, Ph.D., Philadelphia.

New Foundation for Scientific Research.—Establishment of the Passano Foundation, Inc., has been announced by the Williams & Wilkins Company, Baltimore, "for scientific and educational purposes, particularly to provide for scientific research and to publish the results of scientific research and to make awards for meritorious achievements in scientific research." The foundation is named for Mr. Edward B. Passano, chairman of the board of the Williams & Wilkins Company, who has actively been identified with the development of scientific publishing for a period of more than thirty-five years. By the terms of the charter of the foundation, the board of directors may inaugurate the establishment of an annual award not to exceed \$5,000 for the outstanding contribution to the advancement of medical science made within the year by an American citizen. A number of other projects are under consideration, one of which is the advancement of postgraduate instruction among physicians in sections of the country not accessible to medical centers in the larger cities. Mr. Robert S. Gill, president of the Williams & Wilkins Company, has been elected president of the new foundation, which will have its headquarters at Mount

Royal and Guilford avenues, Baltimore 2. Members of the board of directors include Dr. Emil Novak, associate professor of obstetrics, Johns Hopkins University School of Medicine, Dr. George W. Corner, director of the Embryological Laboratory of the Carnegie Institution of Washington, and Mr. George Hart Rowe of the Williams & Wilkins Company, all of Baltimore.

Government Services

Public Health Service Releases Annual Report

The provisional general mortality figure for the first six months of 1943 was 11.0 per thousand of population in the United States, about 3.8 per cent higher than for the corresponding period in 1942, according to the annual report of Surg. Gen. Thomas Parran of the U. S. Public Health Service. The provisional general death rate of 10.4 per thousand of population for the year 1942 was the lowest on record, as also were provisional infant and maternal mortality rates of 40.8 and 2.7 respectively per thousand live births. The mortality from all accidents in 1942 was 68.8 per hundred thousand of population, or approximately 7 per cent lower than in 1941, and the rate for automobile accidents in 1942 was 20.1 per hundred thousand of population, or about 30 per cent less than in 1941. Lower provisional mortality rates were recorded in 1942 for typhoid and paratyphoid, pneumonia, diarrhea and enteritis under 2 years, diphtheria, scarlet fever, whooping cough, tuberculosis, measles, encephalitis and poliomyelitis. Diseases of adult life and old age (cancer, cerebral hemorrhage, diabetes and heart disease) had higher mortality rates. Early in 1943 meningococcal meningitis became epidemic, with an incidence 1.9 times higher for 1942 than the five year median (1937-1941). By the week ended July 21, 1943 12,482 cases had been reported, the largest number since 1914. Poliomyelitis, although below the median expectancy in 1942, became epidemic early in 1943. Incomplete information on diseases in foreign countries indicated increases in quarantinable diseases, especially typhus, in Algeria, Egypt, Morocco, Rumania and Tunisia. A decrease of typhus in Spain was reported. Twice as many cholera cases occurred in China in 1942 as in 1941. Plague and smallpox increased in the majority of countries reporting these diseases. Fourteen countries reported yellow fever in 1942, sixteen in 1941. Bolivia had the highest incidence, with 94 cases and 15 deaths.

GENERAL PUBLIC HEALTH PROGRAM

Total appropriations for the U. S. Public Health Service in the fiscal year 1943 amounted to \$47,037,245. The amount available for grants-in-aid to the states under title VI of the Social Security Act was \$11,000,000. The emergency health and sanitation appropriation was \$9,702,200, and \$12,367,000 was appropriated for venereal disease control.

The total amount of funds budgeted from all sources in the cooperative federal-state-local public health program in the forty-eight states, two territories, Puerto Rico, the Virgin Islands and the District of Columbia during 1943 was \$125,200,874.13, or 5.35 per cent more than the amount budgeted during 1942. The combined federal, state, local and other funds spent for venereal disease control during 1943 was \$19,368,458. State and local funds increased by \$472,500 over the previous year, totaling \$7,457,100. Funds provided by state and local sources increased from 3.2 cents per capita in 1939 to 5.6 cents in 1943. A total of \$21,221,874 was appropriated for the fiscal year for general public health work in the states. This sum included funds for emergency health and sanitation programs, grants-in-aid to state health departments and the prevention of the spread of communicable diseases. The reported increase of funds budgeted by state and local authorities represents an addition of local communities which had not previously reported their budgets to the Public Health Service. In spite of the establishment of new units in war areas, the progress in the expansion of health facilities noted in previous years was not sustained in 1943. Personnel shortages caused the amalgamation of separate local units and the expansion of district units to include more territory. Although the number of counties having some form of full time health service was not reduced substantially, service was spread thinner than in previous years.

Construction of Health Facilities.—Progress in construction of 451 Community Facilities Act health projects approved by President Roosevelt was slow because of material shortages. By July 31, 1943, however, forty-two hospital projects (providing 2,567 beds) and fifty-nine health center projects had

been completed; eighty-six hospital projects (providing 7,574 beds) and sixteen health center projects were under construction.

Malaria Control.—Malaria control activities included drainage operations and larviciding in areas contiguous to 1,161 military, naval and war industry establishments in eighteen states, the District of Columbia and Puerto Rico. Densities of malaria mosquitoes were reduced in and near 92 per cent of the war establishments where control measures were undertaken. *Aedes aegypti* control programs for yellow fever were carried on successfully at Charleston, S. C., and in Miami and Key West, Fla.

Tuberculosis.—In tuberculosis control, chest examinations were given to 320,000 workers in eighty-five war establishments in eleven states and the District of Columbia, and 60,000 migratory workers were examined before entering the United States from Mexico. A routine chest x-ray examination of all Coast Guard and Merchant Marine recruits was undertaken. Study was made of the reporting and follow-up procedures used in each state in regard to men rejected for military service, but only twenty-five states and the District of Columbia established satisfactory follow-up systems.

VENEREAL DISEASE CONTROL

Civilian and military venereal disease control programs prevented an increase in syphilis and gonorrhea among soldiers, sailors and war workers.

A noteworthy achievement of the year was the establishment of a network of rapid treatment centers where experimental studies are carried on to determine which of the intensive syphilis treatment schedules are most effective.

RESEARCH

Results of the many investigations undertaken by the National Institute of Health at the request of the Army, the Navy and other war agencies are being withheld from general circulation until after the war, because of their military significance. Among the achievements of 1943 was the discovery of the virus of a new human disease of the atypical pneumonia group. Another was the discovery of the curative action of isotonic solution of sodium chloride administered by mouth in various forms of shock. A study of the epidemiology of trichinosis leading to demonstration of the widespread prevalence of this infection in the United States and proposals for its control was completed. A contribution was made to our knowledge of dysentery, including incidence, carriers, diagnosis, treatment and control among troops. The first transformation was made of normal mammalian cells, grown in test tubes and isolated from the living organism, into cancer cells that would invade and kill animals of the same strain from which the cells originally came. Other studies were made of carcinogenesis, the characteristics of tumor tissue and tumor growth. Forty-nine hospitals had loans of radium from the National Cancer Institute at the beginning of the fiscal year.

The provision of medical care in marine hospitals showed a moderate increase in the total number of patient days of relief furnished and an increase in the number of admissions and discharges. Most of the beneficiaries were members of the American Merchant Marine and the U. S. Coast Guard. The expansion of the Coast Guard and the number of alien detention stations created additional demands for service.

Continuous caudal analgesia in obstetrics, developed by two members of the staff at the Staten Island Marine Hospital, received wide recognition as a distinct contribution to the practice of obstetrics. Most of the drug addict population of the Fort Worth (Texas) hospital was transferred to the hospital at Lexington, Ky. At the Fort Worth hospital the treatment of psychotic patients increased under the provisions of Executive Order 9079.

FOREIGN QUARANTINE

Because of the constantly increasing number of airplanes arriving in Washington, D. C., from Africa after a lapse of only thirty-six hours, a quarantine station was established in that city to protect the community from epidemic diseases common in Africa.

OTHER HIGHLIGHTS

The establishment of blood plasma banks in civilian hospitals has become an important nationwide service. At the close of the fiscal year (June 1943) 158,290 units of plasma was available in hospitals and reserve depots in the United States, Alaska and Puerto Rico.

The Public Health Service district office at San Francisco assumed responsibility for the medical care of all Japanese evacuees from Hawaii from the time their ships docked at San Francisco until they were turned over to war relocation authorities. Evacuees from the Orient and Europe arriving at New York were furnished with medical and hospital care.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Jan. 15, 1944.

Results in the Treatment of War Wounded

The excellent arrangements for the prompt evacuation and treatment of the wounded in the war have been described in previous letters to *THE JOURNAL*. It is now possible to give collected statistics. An analysis of 30,000 battle casualties admitted to Middle East hospitals during the year ended March 31, 1943, is now available. It shows a mortality of only 2.1 per cent, compared to 7.44 per cent in the hospitals of Egypt and Palestine during the first world war. The total of deaths in hospitals was 611. It is considered that under the conditions of the last war over 1,500 more patients would have died.

Army medical authorities attribute this remarkable improvement to three main causes: 1. Patients are brought to hospitals in better condition and more rapidly than during the last war. This is accomplished by provision of mobile operating theaters working close to the front line. 2. There are better facilities for blood transfusions. 3. The sulfonamides are universally used. Additional factors are the improved technics, training of army medical orderlies and the use of air ambulances.

A National War Formulary

The war has produced a great shortage of many drugs obtained from the large part of the world which is occupied by the enemy. As in the case of food, the fighting services have priority over civilians, and many drugs, such as quinine, are unobtainable for ordinary use. Among the drugs difficult to supply are catechu and colchicum. To relieve the catechu shortage a chalk mixture containing no catechu is listed in the National War Formulary. Physicians are told that it would be much appreciated if they would consider whether or not this product would suffice before they order chalk mixture with catechu. To relieve the colchicum shortage a tablet of colchicine is listed. This can be used when pharmacists are unable to dispense one of the two official mixtures containing colchicum, but physicians are asked not to order colchicine unless it is considered absolutely necessary.

War conditions render imperative the strictest economy in prescribing drugs. Even if the drugs are available their packing and distribution, often under difficult conditions, make demands on materials, manpower and transportation which can be justified only if the drugs are required for essential medical purposes. Agar is reserved for bacteriologic purposes and should not be prescribed. Bismuth salts should be reserved for the treatment of syphilis and tropical diseases. The prescribing of cinchona products and their synthetic substitutes is prohibited except for the treatment of malaria. Quinidine may be used only for the treatment of cardiac arrhythmia.

Transfusion of the Wounded in Ambulances

The *Army Medical Department Bulletin* reports that in the African campaign many wounded men successfully resuscitated by transfusion in forward medical units collapsed during evacuation. This meant a second resuscitation, which appeared to be neither as rapid nor as complete as the first. To meet this difficulty great resourcefulness and ingenuity were shown in devising means of continuing transfusion during the journey in ambulances and other means of transport. The results of these "traveling transfusions" were highly satisfactory. Between August 1942 and May 1943 they were given to 200 men, and

no patient was traced who, with the transfusion in progress, arrived in a state of shock. The blood pressure was maintained for the whole journey at the initial level, and the systolic pressure of 2 patients had risen by 10. To supervise the transfusion it was necessary for a medical orderly to travel with the patient. If the journey was long, a spare bottle of blood or plasma was sent to enable the transfusion to be continued.

In an ambulance the transfusion is set up in the normal manner with special attention to details. The splinting of the arm must include a firm bandage across the palm to prevent any pronation of the forearm, which would lead to flexion at the elbow and displacement of the needle. The needle must be placed truly into the lumen of the vein for $\frac{1}{2}$ inch. When the set runs satisfactorily the needle union and the surrounding skin are fixed by elastoplast. It is rarely necessary to employ a cannula even in the worst cases of shock. It is important not to fix the arm in a straight splint, for this produces discomfort from hyperextension. For providing rigidity a Cramer wire is bent to an angle of 10 degrees in the middle and enclosed in a plaster slab. The stretcher is placed on the lower bunk on the side, which permits the patient's transfusion arm to be on the inboard side of the stretcher. The orderly carrying the bottle ties the suspender to the forward ventilator in the roof of the ambulance with an 18 inch piece of bandage. Three lengths, tied to the neck of the bottle, are used as stays.

John Swift Joly

The death of John Swift Joly at the age of 67 years has removed one of Great Britain's leading genitourinary surgeons. He was a member of an Irish family distinguished in science and was a descendant of the satirist Dean Swift. His elder brother was astronomer royal in Dublin, and his cousin John Joly, F.R.S., invented the bomb calorimeter and was a pioneer in color photography. After a distinguished university career in science, Joly turned to medicine. He was qualified to practice in 1902 after a brilliant career as a student and then became house surgeon at Sir Patrick Dun's Hospital. He next went abroad with a surgical traveling scholarship to work under Kocher at Berne and in the Vienna clinics. He returned to London and was appointed house surgeon at the Lock Hospital and later at St. Peter's Hospital for Stone. His appointment to the staff of the latter marked the beginning of his career as a specialist. He was a genitourinary surgeon with a wide scientific outlook; he did not write much in the journals, but his work was distinguished by high quality. He embodied his profound knowledge of one subject in his book "Stone and Calculous Disease of the Urinary Organs," which has an international reputation. He was keenly interested in foreign work and was not only a member of the various urologic societies but for a time English secretary of the International Association of Urologists. His loss is mourned by colleagues, patients and friends not only for his knowledge but also for his geniality and great courtesy.

Marriages

WILLIAM ROBERT SCHAFFARZICK, White Sulphur Springs, Mont., to Miss Margaret King of Tuscaloosa, Ala., in Atlanta, Ga., December 29.

WILLIAM JEFFRESS SENTER, Chalybeate Springs, N. C., to Miss Bettye Faye Ashcraft of Mobile, Ala., December 30.

THOMAS H. BREWER JR., Columbus, Ga., to Miss Betty Lopez of Hartford, Conn., in Chicago December 31.

PAUL M. SCOTT, Cozad, Neb., to Miss Janice Sandall of Rock Island, Ill., in Bassett, Neb., December 23.

ANDREW JOSEPH SELLETT, La Salle, Ill., to Miss Betty Lou Peters of Nokomis in Evanston December 18.

Deaths

Albert Edwin Larkin * Syracuse, N. Y.; Syracuse University College of Medicine, 1897; since 1933 professor emeritus of clinical medicine at his alma mater, where he had been professor from 1911 to 1933, associate professor from 1908 to 1911 and lecturer in clinical medicine from 1906 to 1908; specialist certified by the American Board of Internal Medicine; fellow of the American College of Physicians; for many years on the staff of the Syracuse Memorial Hospital and St. Joseph Hospital; member of the board of trustees of Syracuse University from 1921 to 1933; died November 2, aged 71, of generalized arteriosclerosis and macrocytic anemia.

Theodore Carl Hempelmann * St. Louis; Washington University School of Medicine, St. Louis, 1908; associate professor of clinical pediatrics at his alma mater; member of the American Pediatric Society and the American Academy of Pediatrics; specialist certified by the American Board of Pediatrics, Inc.; served as a member of the advisory committee, city health department; consultant pediatrician, St. Louis Children's Hospital, St. Luke's Hospital and St. Louis Maternity Hospital; pediatrician, City Isolation Hospital and the Shriners' Hospital for Crippled Children; died in University City, December 13, aged 58, of coronary thrombosis.

Thomas Clarence Johnson * Lumberton, N. C.; University College of Medicine, Richmond, 1903; past president of the Robeson County Medical Society, which in 1939 presented him with a gold watch in recognition of his outstanding service as physician and surgeon; served as president of the Fifth District Medical Society; fellow of the American College of Surgeons; in 1937 an oil portrait of him was presented by his friends in the community to the Thompson Memorial Hospital, where he had been chief of staff and chief surgeon; the portrait was hung in the Johnson House, a nurses' home named for him; died at the hospital December 31, aged 64, of acute myocardial failure with coronary thrombosis.

John A. Fell, Doylestown, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1874; member of the Medical Society of the State of Pennsylvania; served as a member of the school board and board of health of Doylestown; at one time served as assistant surgeon of the Sixth Regiment of the Pennsylvania National Guard; in 1933 the state medical society paid tribute to him in recognition of his "fifty-nine years of medical service faithfully performed to his community in the traditional ideals of the medical profession"; the oldest alumnus of the University of Pennsylvania School of Medicine; died January 4, aged 93.

James Thomas Sweetman, Ballston Spa, N. Y.; Howard University College of Medicine, Washington, D. C., 1886; formerly secretary of the Saratoga County Medical Society; a founder and honorary chairman of the Saratoga County Tuberculosis Association; a member of the board of managers and on the staff of the Saratoga County Tuberculosis Hospital (Homestead Sanatorium), Middle Grove; served as vice president and director of the Ballston Spa National Bank; a director of Boy Scout work in Saratoga County; died December 13, aged 81.

George Sidney Britten, DeFuniak Springs, Fla.; Syracuse (N. Y.) University College of Medicine, 1900; professor emeritus of otolaryngology at his alma mater; member of the Medical Society of the State of New York; specialist certified by the American Board of Otolaryngology; served in the medical corps, American Expeditionary Forces, during World War I; for many years on the staff of the Hospital of the Good Shepherd, Syracuse University; died in a Pensacola hospital December 27, aged 69, of hemorrhage due to gastric ulcer.

Anders Einar Johnson, Watertown, S. D.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1903; member of the South Dakota State Medical Association and the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; served as president of the South Dakota Academy of Ophthalmology and Otolaryngology; health officer of Codington County from 1932 to 1935; a member of the staff of the Luther Hospital; died December 30, aged 72, of sarcoma of the left lung.

William B. Beaumont, Laceyville, Pa.; College of Physicians and Surgeons, Baltimore, 1891; member of the Medical Society of the State of Pennsylvania; head of the local board of health and surgeon for the Lehigh Valley Railroad for many years; county examiner for the Pennsylvania Bureau of Pensions for the Blind; died in Wyalusing December 22, aged 78.

Adville Crosswell Baskin, Bishopville, S. C.; Vanderbilt University School of Medicine, Nashville, Tenn., 1899; president of the People's Bank; died in Tuomey Hospital, Sumter, December 31, aged 72, of neoplasm of the brain.

Bertram Robert Beers, Evanston, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1908; member of the Illinois State Medical Society; served during World War I; died January 4, aged 61, of acute nephritis and diabetes mellitus.

Thomas A. Boaz, Stoneville, N. C.; College of Physicians and Surgeons of Baltimore, 1892; died in the City Hospital, Winston-Salem, January 3, aged 76, of uremia.

Ralph Earle Brodie * Albion, N. Y.; Cornell University Medical College, New York, 1904; served as coroner of Orleans County and health officer of the village of Albion and the town of Barre; served during World War I; died in the Arnold Gregory Memorial Hospital January 9, aged 65, of chronic myocarditis and chronic nephritis.

Walter Herman Buhlig * Chicago; Northwestern University Medical School, Chicago, 1903; president of the Englewood Branch of the Chicago Medical Society, 1916-1917; served during World War I; senior medical chief of attending staff, Evangelical Hospital; died January 15, aged 67, of decompensation of the heart due to arteriosclerosis and bronchial asthma.

Edwin Holmes Douglas, Petroleum, W. Va.; Bellevue Hospital Medical College, New York, 1894; member of the West Virginia State Medical Association; on the emeritus staff, St. Joseph's Hospital, Parkersburg; died December 28, aged 76, of pernicious anemia.

Henry Stover Foltz, Philadelphia; University and Bellevue Hospital Medical College, New York, 1900; served on the staffs of the Cortland County Hospital, Cortland, N. Y., Newcomb Hospital, Vineland, N. J., and the Royal Pines Hospital, Pinewald, N. J.; died in Barnegat Pines, N. J., December 23, aged 76, of burns received when an oil stove exploded.

Joseph Herbert Augustus Foster, Cornell, Wis.; Trinity Medical College, Toronto, Ont., Canada, 1901; member of the State Medical Society of Wisconsin; on the staff of St. Joseph's Hospital, Chippewa Falls; died suddenly January 1, aged 69, of heart disease.

Jesse Franklin Gamble, Lincolnton, N. C.; University of Tennessee Medical Department, Nashville, 1903; served as a member of the board of aldermen; member of the staff of the Reeves Gamble Hospital; died December 24, aged 65, of cerebral hemorrhage.

Earl M. Gilliam, Columbus, Ohio; Starling Medical College, Columbus, 1888; formerly professor of gynecology at the Ohio State University College of Medicine and associate professor of gynecology at his alma mater; past president of the Columbus Academy of Medicine; formerly chief of staff, St. Anthony Hospital, where he died December 21, aged 76, of cerebral hemorrhage.

Albert Thomas Grills, Lorain, Ohio; Western Reserve University Medical Department, Cleveland, 1904; served on the staff of St. Joseph's Hospital; died December 19, aged 65, of heart disease.

Cornelius Gunderson, Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1904; member of the Illinois State Medical Society; on the staff of the Norwegian-American Hospital; died January 17, aged 70, of carcinoma of the transverse colon with metastases.

Andrew Wade Haden, Summit, Ala.; Vanderbilt University School of Medicine, Nashville, Tenn., 1882; died December 27, aged 89, of chronic nephritis.

Miller Craft Henry, Georgetown, Miss.; Medical Department of Tulane University of Louisiana, New Orleans, 1908; member of the Mississippi State Medical Association; died in Sanatorium January 8, aged 60, following a pneumonectomy.

James Esmond Hereford, Morgantown, W. Va.; Leonard Medical School, Raleigh, N. C., 1913; died December 15, aged 60, of acute coronary heart disease.

Thomas Francis Higgins, Toledo, Ohio; Milwaukee Medical College, 1912; member of the Ohio State Medical Association; served in the medical corps of the U. S. Army during World War I; formerly superintendent of the Lucas County General Hospital and Lucas County Hospital Annex; on the staffs of the Mercy Hospital and St. Vincent's Hospital, where he died December 16, aged 55, of cardiac collapse following an operation.

Roy Albert Hiß, Thomasville, Ga.; Emory University School of Medicine, Atlanta, 1915; fellow of the American College of Physicians; member of the Medical Association of Georgia; served during World War I; on the staff of the John D. Archbold Memorial Hospital; died January 1, aged 54, of coronary thrombosis.

William O. Holloway, Chappells, S. C.; University of Maryland School of Medicine, Baltimore, 1899; member of the South Carolina Medical Association; alderman; died in the Greenwood Hospital, Greenwood, December 28, aged 69, of coronary thrombosis.

Charles L. Hope, Oak Ridge, La.; Memphis (Tenn.) Hospital Medical College, 1894; died December 14, aged 81, of coronary occlusion.

Harry Dresser B. Howe Ⓢ Hampton, Va.; University of Pennsylvania Department of Medicine, Philadelphia, 1895; fellow of the American College of Surgeons; served during World War I; member of the Selective Service Board; for many years on the staff of the Elizabeth Buxton Hospital, Newport News, Veterans Administration Facility, Kecoughton, and the Dixie Hospital; a charter member of the Hampton Rotary Club; died December 27, aged 71, of cerebral hemorrhage and hypertension.

Herbert Waldo Hoyt, Santa Barbara, Calif.; Boston University School of Medicine, 1891; formerly on the staff of the Genesee Hospital, Rochester, N. Y.; died December 30, aged 80, of carcinoma of the stomach.

John Jay Hunt, Bayonne, N. J.; Columbia University College of Physicians and Surgeons, New York, 1908; died January 4, aged 66, of illuminating gas poisoning, a narcotic self administered and a self inflicted bullet wound.

Clarence William Kash, Carlisle, Ky.; Kentucky School of Medicine, Louisville, 1906; served during World War I; died in the Veterans Administration Facility, Dayton, Ohio, December 30, aged 59, of coronary sclerosis.

Robert Mayer Laemle Ⓢ Chicago; Rush Medical College, Chicago, 1935; surgical pathologist, Michael Reese Hospital; served as instructor in obstetrics and gynecology at the University of Illinois College of Medicine; associate obstetrician, Chicago Maternity Center; died December 31, aged 39.

Daniel Joseph Langton Ⓢ Philadelphia; Jefferson Medical College of Philadelphia, 1917; also a pharmacist; served during World War I; on the staffs of the Fitzgerald-Mercy Hospital, Darby, and the Jefferson Medical College Hospital and Misericordia Hospital; died December 27, aged 56, of coronary thrombosis.

Walter Eber Leonard, Los Angeles; Rush Medical College, Chicago, 1916; died January 3, aged 53.

Russell Walter Lowe Ⓢ Ridgefield, Conn.; University of the City of New York Medical Department, New York, 1889; served in the medical corps of the U. S. Army and as chief medical examiner for the Twelfth Connecticut Selective Service District during World War I; formerly health officer; on the staff of the Danbury Hospital, Danbury; died January 3, aged 75, of arteriosclerosis and cerebral hemorrhage.

Mars Laurice Madsen, Canova, S. D.; Rush Medical College, Chicago, 1926; member of the South Dakota State Medical Association; died January 8, aged 45.

Amos A. Martin, Kokomo, Ind.; Medical College of Indiana, Indianapolis, 1896; died in an Indianapolis hospital December 14, aged 79, of chronic myocarditis and chronic rheumatism.

Royse Wood Martin, Las Vegas, Nev.; University Medical College of Kansas City, Mo., 1903; formerly a member of the state legislature; served as president of the Las Vegas Hospital Association; for many years chief surgeon for the Las Vegas and Tonopah Railroad; a charter member of the chamber of commerce and Rotary Club and former president of both; on the staff of the Basic Magnesium Hospital, where he died December 22, aged 69.

Joseph K. McCance, Pittsburgh; University of Pennsylvania Department of Medicine, Philadelphia, 1881; died December 30, aged 86, of general arteriosclerosis.

George McClintock, Overbrook, Kan.; College of Physicians and Surgeons, Medical Department of Kansas City University, Kansas City, 1899; member of the Kansas Medical Society; died December 27, aged 71.

Ardley H. McLaughlin, Aurora, Ill.; Eclectic Medical Institute, Cincinnati, 1890; member of the staff of the Copley Hospital, where he died January 13, aged 75.

John W. Millette Ⓢ Dayton, Ohio; Ohio Medical University, Columbus, 1903; member of the American Academy

of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; specialist certified by the American Board of Otolaryngology; for many years on the staffs of the Veterans Administration Facility, National Military Home, and St. Elizabeth Hospital, where he died December 28, aged 79, of cirrhosis of the liver and myocarditis.

James Warren Milligan, North Madison, Ind.; Rush Medical College, Chicago, 1889; member of the Indiana State Medical Association and the American Psychiatric Association; since 1915 medical superintendent of the Madison State Hospital; formerly physician in charge of the Indiana State Prison Hospital, Michigan City; member of the Rotary Club; died in the Methodist Hospital, Indianapolis, January 5, aged 84, of respiratory failure following an operation for stones in the bladder.

John Gray Morris, Geneseo, N. Y.; University of Buffalo School of Medicine, 1904; served during World War I; for many years health officer; died December 21, aged 70, of cerebral hemorrhage.

Thomas H. Murphy Ⓢ Pawtucket, R. I.; University and Bellevue Hospital Medical College, New York, 1899; at one time a lieutenant (jg) in the U. S. Navy; formerly chairman of the school committee; consulting surgeon, St. Joseph Hospital, Providence; died in December, aged 71, of pneumonia.

Raymond G. Olson Ⓢ Muskegon Heights, Mich.; Jenner Medical College, Chicago, 1900; formerly city health officer and president of the board of education; on the staffs of the Mercy Hospital and the Hackley Hospital, Muskegon, where he died December 25, aged 72, of pneumonia and myocarditis.

Robert Carpenter Panter Ⓢ Dorchester, Neb.; University of Nebraska College of Medicine, Omaha, 1904; served in the medical corps of the U. S. Army during World War I; on the nonresident staffs of St. Elizabeth, Lincoln General and Bryan Memorial hospitals, Lincoln; died December 10, aged 61, of carcinoma of the pancreas.

William Edward Patterson, Tempe, Ariz.; Arkansas Industrial University Medical Department, Little Rock, 1884; died in St. Joseph Hospital, Phoenix, December 10, aged 82, of cardiorenal vascular disease.

Oscar Legier Perkins, Clarksdale, Mo.; Northwestern Medical College, St. Joseph, 1892; De Kalb County physician; served during World War I; at one time postmaster of Union Star; a member of the school board; formerly a medical officer for the Civilian Conservation Corps at Ely, Minn.; died in a St. Joseph hospital December 15, aged 76.

Louis William Pijan, Warm Springs, Ore.; Jenner Medical College, Chicago, 1906; served during World War I; since 1929 physician for the Indian Service; died suddenly December 28, aged 62, of heart disease.

Woolsey B. Potter, Bayside, N. Y.; Medico-Chirurgical College of Philadelphia, 1902; died December 15, aged 68.

Laurence Rutherford Quilliam, Seattle; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1908; member of the Washington State Medical Association; served in the medical corps of the U. S. Army during World War I; associated with the Veterans Administration; died in Dearborn, Mich., December 22, aged 63, of carcinoma of the intestine.

Spence Redman Ⓢ Platte City, Mo.; Jefferson Medical College of Philadelphia, 1883; an organizer of the Platte County Medical Society and served as its president, secretary and treasurer; had been secretary of the society consecutively since 1923 and for many years councilor of the twelfth district; died December 21, aged 81.

Homer Reese Ⓢ Gallatin, Tenn.; Vanderbilt University School of Medicine, Nashville, 1901; past president and secretary of the Sumner County Medical Society; served as a major in the medical corps of the U. S. Army during World War I; died January 1, aged 68, of cardiac asthma.

John T. Robertson, Cabool, Mo.; Kansas City Medical College, 1894; member of the Missouri State Medical Association; died November 27, aged 76.

Edwin M. Rodenberger, Macedon, N. Y.; Homeopathic Medical College, Cleveland, 1885; chairman of the water system board; died December 19, aged 83, of myocarditis and spastic paraplegia.

Sherwood Dwight Sawyer, Hilton, N. Y.; Baltimore Medical College, 1908; member of the Medical Society of the State of New York; health officer of Hilton; died in the Strong Memorial Hospital, Rochester, January 11, aged 65, of congestive heart disease.

Albert Theodore Schmidt, Wilkinsburg, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1908; died December 26, aged 60, of chronic myocarditis.

William Jasper Shelton & Mayfield, Ky.; Kentucky School of Medicine, Louisville, 1902; on the staffs of the Mayfield and Fuller-Gilliam hospitals; instantly killed December 24, aged 71, in an automobile accident.

Lucy M. Shepherd, New York; the Hahnemann Medical College and Hospital, Chicago, 1894; died in Bayside, N. Y., December 12, aged 79.

Morris Abraham Silberg, Boston; Tufts College Medical School, Boston, 1920; member of the Massachusetts Medical Society; died November 20, aged 50.

Jay Claude Simmons, Canton, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1906; formerly a deputy coroner; a past president of the Rotary Club of Canton and the board of education; on the staff of the Graham Hospital; died December 22, aged 65, of coronary thrombosis.

Ferdinand Stabel, Redding, Calif.; Cooper Medical College, San Francisco, 1896; formerly county physician and health officer; died December 8, aged 72, of bilateral pneumonia and uremia.

Frederick Parks Steck & Shamokin, Pa.; Medico-Chirurgical College of Philadelphia, 1908; formerly county coroner; died December 23, aged 75, of heart disease.

Ora Leonidas Stephenson, Indianapolis; Medical College of Indiana, Indianapolis, 1891; died in St. Vincent's Hospital December 17, aged 78.

Jacob James Stotter, New York; Medizinische Fakultät der Universität Wien, Austria, 1890; died in Miami Beach, Fla., December 29, aged 80.

Gustavus E. Stromberg, Langdon, N. D.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1909; coroner and health officer of Cavalier County and health officer of Langdon for many years; served as secretary of the staff and chief, Mercy Hospital; died December 21, aged 59, of coronary occlusion.

Albert Ernest Stuht, Seattle; John A. Creighton Medical College, Omaha, 1896; for many years director of health and chairman, Washington State Board of Health; formerly associated with the U. S. Public Health Service; served as physician and health officer of Spokane County; at one time resident director of the Edgecliff Sanatorium, Spokane; served as a medical officer for the American Mail Line; died in the U. S. Marine Hospital December 25, aged 72, of pneumonia, following influenza.

Orlando G. Taylor, Palestine, Ill.; College of Physicians and Surgeons of Chicago, 1893; member of the Illinois State Medical Society; district surgeon for the Illinois Central Railway; died December 30, aged 80, of myocarditis.

Edward Reed Wagner, Claremont, Calif.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1887; at one time a medical missionary in China; served as director of the San Jose Y. M. C. A.; on the staffs of the San Jose Hospital and the Santa Clara County Hospital, San Jose; died in the Pomona Valley Community Hospital, Pomona, December 16, aged 81, of coronary infarct.

Theron Otis Walker, Greer, S. C.; Medical College of the State of South Carolina, Charleston, 1914; served in the medical corps of the U. S. Army during World War I; for many years a member of the board of education; on the staff of the Spartanburg General Hospital, Spartanburg, Greenville

General Hospital and St. Francis Hospital, Greenville; died December 27, aged 52, of myocardial failure following cerebral embolism.

Harold Graves Waller, Ann Arbor, Mich.; University of Michigan Medical School, Ann Arbor, 1920; instructor, department of internal medicine, at his alma mater; resident on the staff of the University Hospital; died December 26, aged 48.

Thomas M. Walsh & Hasbrouck Heights, N. J.; Maryland Medical College, Baltimore, 1903; on the staff of the Hackensack Hospital, Hackensack; surgeon for the police and fire departments; died December 21, aged 62, of cardiovascular renal disease.

William Wilbur Warne, Brownsville, Pa.; Jefferson Medical College of Philadelphia, 1889; died in Kingston, N. Y., December 24, aged 81, of chronic myocarditis.

Louis Roy Wayman, Murphysboro, Ill.; St. Louis College of Physicians and Surgeons, 1909; member of the Illinois State Medical Society; on the staff of St. Andrew's Hospital, where he died December 20, aged 63, of hypertension, arteriosclerosis and nephritis.

James F. Webb, Decatur, Ga.; Atlanta Medical College, 1869; Civil War veteran; died December 28, aged 95, of chronic heart disease.

Edward Herman Wehle, Milwaukee; Milwaukee Medical College, 1898; also a pharmacist; died at his home in Pewaukee December 24, aged 69, of cardiac embolism.

Ellis Bruce Wenner, Philadelphia; Medico-Chirurgical College of Philadelphia, 1891; died in the Delaware County Hospital, Drexel Hill, Pa., December 31, aged 76, of heart disease.

David White, Tobbinsport, Ind.; University of Louisville (Ky.) Medical Department, 1890; died December 26, aged 77, of pneumonia.

Sara C. Wilcox, Denver; Colorado School of Medicine, Boulder, 1897; member of the Colorado State Medical Society; on the staff of the Children's Hospital; died in Santa Barbara, Calif., December 23, aged 76, of pneumonia.

Bernice A. Zeigler & Shamrock, Texas; Memphis (Tenn.) Hospital Medical College, 1901; city health officer; on the staff of St. Mary's Hospital; died December 23, aged 70, of lobar pneumonia.

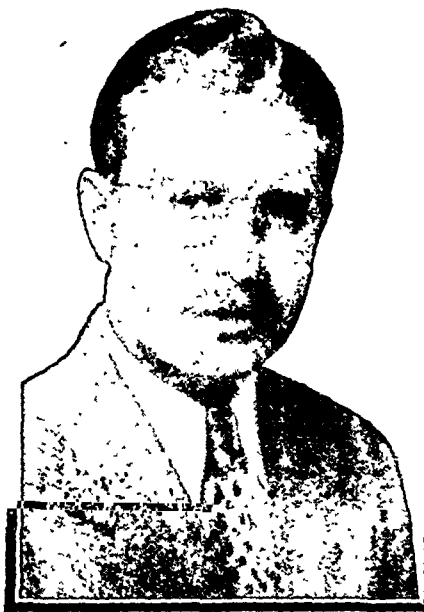
KILLED IN ACTION

Haskell Benjamin Rosenblum & Passed Assistant Surgeon, U. S. Public Health Service, Newton Center, Mass.; Cornell University Medical College, New York, 1938; commissioned assistant surgeon in the U. S. Public Health Service Reserve; assigned to National Training School for Boys, Washington, D. C., Nov. 6, 1939 and commissioned in the regular corps; assigned to the Marine Hospital, Ellis Island, N. Y., Jan. 2, 1940; assigned as chief medical officer at the National Training School for Boys on June 29, 1940, and as chief medical officer aboard Coast Guard Cutter Muskeget, June 28, 1942; promoted to grade of passed assistant surgeon in the regular corps on Aug. 16, 1942; aged 32; reported missing in action Sept. 9, 1942 after the Muskeget was lost at sea; reported dead Oct. 14, 1943 by the U. S. Public Health Service.

George Alexander Wildmann, Trenton, N. J.; Jefferson Medical College of Philadelphia, 1938; member of the Medical Society of New Jersey; captain, medical corps, Army of the United States; awarded the Purple Heart Medal for meritorious work; killed in action in the North African area October 7, aged 30.



HASKELL B. ROSENBLUM, P. A. S.,
U. S. P. H. S., 1911-1943



CAPT. GEORGE A. WILDMANN
M. C., A. U. S., 1913-1943

Correspondence

STANDARDIZATION OF BIBLIOGRAPHIC REFERENCES

To the Editor:—You have frequently been the recipient of many excellent suggestions intended for general improvement of the medical and allied professions. Recently the recommendation to advocate universal adoption of the metric system in lieu of the apothecary system was given prominence and justifiably so. Can you listen to another?

All too frequently authors of proposed publications in the medical sciences are confronted with varying whims and idiosyncrasies of editorial board members in relation not only to structure, content and style of presentation but in particular to one feature of a manuscript which should by all measures of practicability, and convenience be uniform, namely the bibliographic notations. Your organization has made a real contribution in the direction of standardization in this situation, but spasmodic or rhythmic reference must apparently be indulged in until our editorial boards eventually see the "wisdom of (your) ways" and follow suit.

If one chooses to note a certain reference one would have to arrange the content in varying manner, the form utilized depending on the medium of publication employed. Recently a perusal of ten journals appearing alphabetically on our library reference shelf presented the following potential variations of a reference chosen at random:

1. Tuckwiler, P. A.: Am. J. Med. Sc. **184**, 473, 1932 (no title) (*American Journal of the Medical Sciences*).
2. Tuckwiler, P. A.: Title. Am. J. Med. Sc., **184**, 473, 1932 (*American Journal of Tropical Medicine*).
3. Tuckwiler, P. A.: Title, Am. J. M. Sc. **184**: 473 (Aug.) 1932 (*THE JOURNAL*).
4. Tuckwiler, P. A.: Title, Am. J. M. Sc., 1932, 184, 473 (*American Review of Tuberculosis*).
5. Tuckwiler, P. A. 1932 Title. Am. J. Med. Sc., vol. 184, pp. 473- (*Anatomical Record*).
6. Tuckwiler, P. A.: Title, Am. J. Med. Sc. **184**: 473- (Aug.) 1932 (*Anesthesiology*).
7. Tuckwiler, P. A.: Title, Am. Jr. Med. Sc. 1932, clxxxiv, 473 (*Annals of Internal Medicine*).
8. Tuckwiler, P. A.: Title, Am. J. Med. Sc. 184: 473 (Aug.), 1932 (*Annals of Otolaryngology, Rhinology and Laryngology*).
9. Tuckwiler, P. A.: Title, Am. Jour. Med. Sc. **184**, 473, August, 1932 (*Annals of Surgery*).
10. Tuckwiler, P. A. Am. J. Med. Sci. **184**, 473 (1932) (*Archives of Biochemistry*).

Note that the only true uniformity concerns the position of the author's name. Most journals follow the author with a colon; two in this group use the period. Some prefer titles others do not. The date of publication is placed first by some, last by others, and one even specifies parenthetical enclosure. The month of publication is mandatory in some journals but deleted in others. Roman numerals are still utilized (7) for volume designation but fortuitously not too frequently. Abbreviations concerning the journal cited are surprisingly consistent, but even here some must be individualistic and stray aberrantly by using Sci. instead of Sc. (10), Jr. (7) and Jour. (9) instead of J. The closest approximation to similarity is between numbers 3, 6 and 8, but note that even in 6 the pages covered by the article are specified, e. g. 473-477 etc. and 8 employs the comma after the parentheses.

Enough to prove the point; to have peregrinated further would not only have been discouraging but probably nauseating as well. Must some editorial boards still insist on utilizing the same pattern only because a change or break in consistency is traditionally resisted? Can there be better reasons? Why not all conform to *THE JOURNAL* and *Quarterly Index* pattern, to which many editors now conform? Standardization in this situation would be generally appreciated.

FREDRICK F. YONKMAN, M.D., Detroit.

Professor of Pharmacology and Therapeutics,
Wayne University College of Medicine.

THE OPTIMAL TEST DOSE IN TUBERCULOSIS RESEARCH

To the Editor:—It would be desirable to obtain an unassailable degree of protection against human tuberculosis. But how much are we willing to accept, at a time when BCG, good diagnosis, segregation, rest in bed for a year, collapse therapy, adequate vitamin intake and the intriguing but elusive prospect of drug or enzyme therapy are just about all that we have established in this field?

The chronic disease itself is intrinsically and indirectly just as great a problem as the actual number of deaths it causes. Most human tuberculosis is not fatal, though it spreads in households and institutions and may cause great misery and economic loss. The recognizable disease is but seldom contracted by a casual infection, in the street car or subway, but usually by several subfatal doses in a dwelling permeated with infection.

From these facts it follows that significant protection against even 1 minimum lethal dose might be quite helpful against special risks, even if not all that is desired. Yet nearly all tuberculosis research has been done with 10, 100 or 1,000 minimum lethal doses in an animal (the guinea pig), in which 1 minimum lethal dose is often so small an amount as to be difficult to measure without error.

I have recently seen significant protection (*Proc. Soc. Exper. Biol. & Med.*, October 1943) against subfatal and just about fatal doses of tubercle bacilli in rabbits (and even guinea pigs) by the use of the "asphyxiated tuberculosis vaccine." But I anticipate that some one may "explode" this vaccine by testing it with 1,000 minimum lethal doses in the guinea pig. Vaccination also will be opposed even without further test by many who have seen failure of protection by other killed vaccines against colossal test doses.

TRUMAN SQUIRE POTTER, M.D.,
Laboratory of Preventive Medicine,
University of Chicago.

SIMPLIFIED PLASTER OF PARIS TECHNIC FOR LARGE PLASTERS AND SHELLS

To the Editor:—The war has brought increased interest and demands for the use of plaster of paris. The article by Capt. I. V. Luck in *THE JOURNAL*, January 1, analyzes the requirements for good plaster technic as carried out with bandages, splint and slabs. In my experience the use of "plaster towels" made up of old rags, towels and sheets and impregnated with plaster pie as recommended by F. Calot-Paris in 1926 is a great improvement because it saves time, is less expensive and is more durable and elegant. I am using it in various orthopedic hospitals after spine and hip operations which require especially fast and reliable plaster protection.

Discarded regular size towels, rags, four layers of crinoline or any rough texture material measuring 15 by 20 inches for posterior shells and hip spicas or 5 by 20 inches for arm or leg splints, after being wrung out in warm water, are soaked in homogeneous plaster of paris pie (ratio 6 cups of powder to 4 cups of lukewarm water), adapted to the body contour and molded snugly. While the hardening plaster pie is renewed after six to eight layers they can be reinforced by one 6 inch plaster bandage and molded until the "critical point" of setting is reached. More layers are added, usually up to twelve, until the necessary strength is reached. The edges can be trimmed the following day, and the shell is padded and covered with stockinet.

ERNEST H. BETTMANN, M.D.,
680 West End Avenue,
New York.

DETERMINATION OF BLOOD SULFONAMIDES

To the Editor:—In the January 1 issue of *THE JOURNAL* there appeared an article by Dr. Johan T. Peters entitled "Easy and Accurate Method for Determination of Blood Sulfonamides from One Drop of Blood from the Finger Tip." The author quotes extensively our paper on the same subject (Determination of sulfanilamide and Its Derivatives in Blood, *Am. J. Clin. Path.*, Tech. Supp. 6:22 [March] 1942) and, in the main, concurs with our findings and suggestions.

On page 32, Dr. Peters states that "Churg's method was tried, which, compared with its predecessors, has many advantages. The method using sulfanilamide standards requires up to now, according to the description, 1 cc. of blood and has therefore to be considered as a macro method, as are all methods which use more than one drop of blood." The author then proposes in his micro modification for determination of "free" sulfanilamide only the use of 0.25 cc. of blood, which is certainly more than one drop. Dr. Peters apparently overlooked that 1 cc. of blood was suggested by us for the determination of both free and total sulfanilamide, whereas 0.5 cc. represents the actual maximum amount required for a single determination. Moreover, as stated in our publication on page 23, determination of free sulfanilamide "can be performed even on 0.2 ml. of blood. . . . By the use of narrow comparison tubes . . . it is possible to determine the drug concentration in 0.1 ml. of blood." In addition, on the same page of our publication reference is made to an earlier report with which Dr. Peters seems to be unfamiliar, entitled "A Simple Micro Test for Sulfanilamide and Its Derivatives in Blood," published in the *American Journal of the Medical Sciences* (202:687 [Nov.] 1941) and based on the same principles. Compared with the latter method, the procedure of Dr. Peters appears to have several drawbacks which handicap its usefulness, especially as an office and bedside test:

1. The amount of blood necessary for a single determination is considerable (0.25 cc. instead of 0.1 cc. as recommended by us) and often difficult to obtain from the finger tip, even by a trained technician.

2. Hemolysis with saponin, a procedure abandoned in our method, is reintroduced, thus increasing the number of reagents. The close agreement of values obtained with the method of Bratton and Marshall and our micro test proved that in aqueous blood dilutions of 1:20 or more the use of saponin can be safely omitted. The introduction of a mortar and pestle represents another time consuming and cumbersome addition.

3. The necessity of keeping standard solutions of sulfanilamide and preparing standards every two weeks certainly complicates the test. Artificial standards as suggested by us (mixture of solutions of potassium dichromate and potassium chromate) are not only permanent but, for an average eye, match the sulfanilamide standards very well. Of course, color perception varies, and perhaps to some persons these artificial standards may appear slightly different in shade. Furthermore, the color produced by sulfanilamide derivatives does not match exactly the color of sulfanilamide itself, whether determination is done with p-dimethylaminobenzaldehyde or by the diazotization according to Marshall. In order to obtain an absolutely perfect match, a stock of standard solutions for each and every sulfonamide derivative would have to be maintained.

Moreover, the reduction in the number of standards as suggested by Dr. Peters (four instead of eleven) also diminishes range and accuracy very much. Permanent standards, on the other hand, can be used in considerable numbers and closely spaced, thus increasing the accuracy of the reading and the range of the method.

With regard to the well known color reaction between Ehrlich's reagent and urobilinogen, which gives a strongly

pink color, Dr. Peters mistakenly quoted as our finding (p. 32) that the color reaction with urobilinogen is fifty times weaker than with the sulfonamides. Since the sulfonamides give a yellow color, direct comparison with urobilinogen would not be possible.

To summarize, the procedure suggested by Dr. Peters requires much more blood, is technically more complicated and less accurate and therefore offers no advantages over the micro test proposed by us in 1941. Consequently, the latter test seems to answer better the needs of the physician or of a small laboratory.

JACOB CHURG, 1st Lieutenant,
M. C., A. U. S.

DAVID LEHR, M.D.,
Instructor in Pharmacology,
New York Medical College, Flower
and Fifth Avenue Hospitals.

REGULATIONS ON THE CARE OF WIVES AND CHILDREN OF ENLISTED MEN

To the Editor:—What purpose is accomplished by cluttering our very fine journal with such nonsensical material smearing pages 241-246 of the January 22 issue, when the entire program could have been condensed in one-half to one page?

I note in page 245 that some crackpot in the Children's Bureau, doubtless a former worker in bric-a-brac, has stated "there shall be a separate bed for each patient." Doubtless this statement should be called to the attention of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons, as it marks a profound advancement brought to us by socialized medicine, under the Emergency Maternity and Infant Care Program.

GERALD E. MURPHY, M.D., Mount Morris, N. Y.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

EXAMINING BOARDS IN SPECIALTIES

Examinations of the Examining Boards in Specialties were published in *THE JOURNAL*, Feb. 12, page 461.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, Feb. 21-24. Sec., Dr. B. F. Austin, 519 Dexter Ave., Montgomery.

ARIZONA: * Phoenix, April 4-5. Sec., Dr. J. H. Patterson, 826 Security Bldg., Phoenix.

ARKANSAS: * March. Sec., Dr. D. L. Owens, Harrison, *Eclectic*. Little Rock, June 8. Sec., Dr. C. H. Young, 1415 Main St., Little Rock.

COLORADO: * Denver, April 4-7. Sec., Dr. J. B. Davis, 831 Republic Bldg., Denver.

CONNECTICUT: * *Medical*. Written. Hartford, March 14-15. Endorsement. New Haven, March 28. Sec. to the Board, Dr. Creighton Barker, 258 Church St., New Haven. *Homeopathic*. Derby, March 13-14. Sec., Dr. J. H. Evans, 1488 Chapel St., New Haven.

DISTRICT OF COLUMBIA: * *Reciprocity*. Washington, March. Sec., Commission on Licensure, Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington.

FLORIDA: * Jacksonville, June 26-27. Sec., Dr. W. M. Rowlett, Box 786, Tampa.

ILLINOIS: Chicago, April 4-6. Supt. of Registration, Department of Registration and Education, Mr. Philip Harman, Springfield.

INDIANA: Indianapolis, May 2-4. Sec., Board of Medical Registration and Examination, Dr. W. C. Moore, 301 State House, Indianapolis.

MAINE: Portland, March 14-15. Sec., Board of Registration of Medicine, Dr. A. P. Leighton, 192 State St., Portland.

MASSACHUSETTS: Boston, March 14-17. Sec., Board of Registration in Medicine, Dr. H. Q. Gallupe, 413-F State House, Boston.

MISSOURI: St. Louis, August. Sec., State Board of Health, Dr. James Stewart, State Capitol Bldg., Jefferson City.

MONTANA: Helena, April 3-5. Sec., Dr. O. G. Klein, First National Bank Bldg., Helena.

NEW HAMPSHIRE: Concord, March 9-10. Sec., Board of Registration in Medicine, Dr. D. G. Smith, State House, Concord.

NEW MEXICO: * Santa Fe, April 10-11. Sec., Dr. LeGrand Ward, 141 Palace Ave., Santa Fe.

NEW YORK: Albany, Buffalo, New York City and Syracuse, June 26-29. Sec., Dr. R. R. Hannon, Education Bldg., Albany.

NORTH DAKOTA: Grand Forks, July 5-8. Sec., Dr. G. M. Williams, 4½ S. Third St., Grand Forks.

RHODE ISLAND: * Providence, April 6-7. Chief, Division of Examiners; Mr. Thomas B. Casey, 366 State Office Bldg, Providence.
SOUTH CAROLINA: Columbia, June 26-28. Sec., Dr. N. B. Heyward, 1329 Blandena St., Columbia.
TEXAS: Houston, March 22-24. Final date for filing application is March 10. Sec., Dr. T. J. Crowe, 918 20 Texas Bank Bldg, Dallas.
WEST VIRGINIA: Charleston, May 1-3. Commissioner, Public Health Council, Dr. John E. Offner, State Capitol, Charleston.
WISCONSIN: * Milwaukee, June 27-29. Sec., Dr. C. A. Dawson, Tremont Bldg, River Falls.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARKANSAS: Little Rock, March 6. Sec., Mr. L. E. Gebauer, 701 Main St., Little Rock.
COLORADO: Denver, March 8-9. Sec., Dr. E. B. Starks, 1459 Ogden St., Denver.
DISTRICT OF COLUMBIA: Washington, April 17-18. Sec., Commission on Licensure, Dr. G. C. Ruhland, 6150 E. Municipal Bldg, Washington.
FLORIDA: Gainesville, June 8. Sec., Dr. J. F. Conn, John B. Stetson University, DeLand.
IOWA: Des Moines, April 11. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Bldg, Des Moines.
MICHIGAN: Ann Arbor and Detroit, May 12-13. Sec., Miss Eloise LeBeau, 101 N. Walnut St., Lansing.
MINNESOTA: Minneapolis, April 4-5. Sec., Dr. J. C. McKinley, 126 Millard Hall, University of Minnesota, Minneapolis.
NEBRASKA: Omaha, May 2-3. Dir., Bureau of Examining Boards, Mr. Oscar T. Humble, 1009 State Capitol Bldg, Lincoln.
OREGON: Portland, March 4. Sec., Board of Higher Education, Mr. C. D. Byrne, University of Oregon, Eugene.
SOUTH DAKOTA: Vermillion, June 4-5. Sec., Dr. G. M. Evans, Yankton.
WISCONSIN: Madison, April 1. Sec., Prof. R. N. Bauer, 152 W. Wisconsin Ave., Milwaukee.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Acute Appendicitis Mistaken for Extrauterine Pregnancy: Emergency as Creating Implied Consent to Different Operation than That Expressly Authorized.—The patient, while pregnant, complained of pains in her lower right abdomen and of nausea, and her attending physician, Dr. Harris, made a diagnosis of extrauterine pregnancy. At his request Dr. Bachrach, a surgeon, was called in for consultation. He made a pelvic examination, finding a mass the size of a small orange in the right ovarian region. Dr. Bachrach then confirmed Dr. Harris's diagnosis and advised an immediate operation, which was performed by Dr. Bachrach. Apparently the only express authority given Dr. Bachrach was to remove the supposed tubal pregnancy. On opening the abdomen the surgeon ascertained that the diagnosis of extrauterine pregnancy was incorrect, that the patient had a double uterus, that a normal pregnancy was present, and that there was "a very acute appendix," which he removed. In the surgeon's opinion the patient made an uneventful recovery and the two physicians involved in the case were satisfied that the source of the patient's trouble had been removed. Subsequently at normal term and in a normal way the patient gave birth to a normal child. Later Dr. Bachrach sued the patient's husband to recover compensation for the performance of the operation. The husband resisted the surgeon's claim on the sole ground that the appendix had been removed without the consent of himself or his wife and that the operation, having gone further than was authorized, constituted a trespass or assault on the wife. From a judgment in favor of the surgeon the defendant appealed to the municipal court of appeals for the District of Columbia.

We recognize and follow, said the municipal court of appeals, the rule announced in *Schloendorff v. Society of New York Hospital*, 211 N. Y. 125, 105 N. E. 92, in which Justice Cardozo said:

Every human being of adult years and sound mind has a right to determine what shall be done with his own body, and a surgeon who performs an operation without his patient's consent commits an assault, for which he is liable in damages. . . . This is true, except in cases of emergency where the patient is unconscious, and where it is necessary to operate before consent can be obtained.

The question in this case is whether an emergency existed so as to justify the removal of the appendix without the express consent of the patient. To answer this question we must look at the picture through the eyes of the surgeon. The patient lay before him on the operating table, her abdomen laid open,

and unconscious from the anesthetic. Her pregnancy was a normal one in the uterus and not tubal as he and the attending physician had thought it was. She did reveal a very unusual structural condition in the form of a double uterus. More immediately important, he beheld a very acute appendix with all its potentially dangerous consequences. What was he to do? Should he have left her on the operating table, her abdomen exposed, and gone in search of her husband to obtain express authority to remove the appendix? Should he have closed the incision on the inflamed appendix and subjected the patient, pregnant as she was, to the danger of a general spread of the poison in her system, or to the alternative danger and shock of a second, independent operation to remove the appendix? Or should he have done what his professional judgment dictated and proceed to remove the offending organ, regarded as it is as a mere appendage serving no useful physiologic function and causing only trouble, suffering, and oft-times death? The defendant does not claim that the surgeon used bad judgment, or that the operation was not dictated by sound surgical procedure, or that it was a failure. He claims only that it was unauthorized and makes no real showing of resulting injury or damage. True, the patient claimed she had had no abdominal pains before the operation; but if that is so it is difficult to understand why the plaintiff was called in at all. The patient further complained of suffering and inability to get around and climb stairs after the operation, but we take judicial notice that such is the normal sequel of most surgical operations, especially in presence of pregnancy. This case is not one in which a patient was rendered barren; on the contrary, her fetus was not disturbed and she achieved motherhood in a normal manner. Nor was she crippled or otherwise mutilated; on the contrary, the operation was a success, and she is forever relieved from the fear and danger of appendicitis. And yet we are asked to deny the surgeon's fee because he comes into court unable to show express authority for the excision he made. It seems to us that to adopt that view would be granting poor reward indeed for faithful professional service. Moreover, this would require us to shut our minds and eyes, as judges, to "truths that all others can see and understand." To accept this view, we would have to deny that it was an emergency and declare a rule which would tend to make every surgeon litigation conscious instead of duty conscious as he stands, scalpel in hand, over his unconscious patient. This we decline to do. We hold the law to be that in case of emergency a surgeon may lawfully perform, and it is his duty to perform, such operation as good surgery demands even when it means extending the operation further than was originally contemplated; and that for so doing he is neither to be held in damages nor denied recovery of his fee. The law should encourage self-reliant surgeons to whom patients may safely entrust their bodies, and not men who may be tempted to shirk from duty for fear of a law suit. The law does not insist that a surgeon shall perform every operation according to plans and specifications approved in advance by the patient, and carefully tucked away in his office safe for courtroom purposes.

The court accordingly held that under the present circumstances authority to proceed with the operation was born of the emergency and conferred on the surgeon the legal right to proceed as he did. The judgment in favor of the surgeon was accordingly affirmed.—*Barnett v. Bachrach*, 34 A. (2d) 626 (Dist. of Col., 1943).

Society Proceedings

COMING MEETINGS

Arizona State Medical Association, Phoenix, April 14-15. Dr. Frank J. Milloy, 112 N. Central Ave., Phoenix, Secretary.
Florida Medical Association, St. Petersburg, April 13-14. Dr. Shaler Richardson, 111 West Adams St., Jacksonville, Secretary.
Minnesota State Medical Association, Rochester, April 13-15. Dr. B. B. Souster, 493 Lowry Medical Arts Bldg., St. Paul, Secretary.
New Orleans Postgraduate Medical Assembly, New Orleans, March 6-9. Dr. Joseph S. D'Antoni, 1430 Tulane Ave., New Orleans 13, Secretary.
Northern Tri-State Medical Association, Toledo, Ohio, April 11. Dr. Oscar P. Klotz, 127 W. Hardin St., Findlay, Ohio, Secretary.
Tennessee State Medical Association, Nashville, April 11-13. Dr. H. H. Shoulters, 706 Church St., Nashville, Secretary.
Tri States Medical Association of the Carolinas and Virginia, Charlotte, N. C., Feb. 28-29. Dr. James M. Northington, 804 Professional Bldg., Charlotte, N. C., Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1934 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis

26:577-720 (Nov.) 1943

Structure and Innervation of Conductive System of Heart of Dog and Rhesus Monkey, as Seen with Silver Impregnation Technique. J. F. Nonidez.—p. 577.

*Capillary Studies in Migraine: Effect of Ergotamine Tartrate and Water Diuresis. W. Redisch and R. H. Pelzer.—p. 598.

*Blood Pressure in Essential Hypertension: Effect of Several Reputedly Hypotensive Drugs. J. S. Kapernick.—p. 610.

Normal Blood Pressure in Lower Extremity. M. H. Wendkos and P. L. Rossman.—p. 623.

Comparison of Actions of Four Cardiac Glycosides on Patient with Congestive Heart Failure. L. W. Eichelua and T. Taube.—p. 631.

*Subarachnoid Hemorrhage Caused by Ruptured Intracranial Aneurysm. A. L. Sahs and P. G. Keil.—p. 645.

Electrocardiographic Considerations in Small Animal Investigations. M. B. Rappaport and I. Rappaport.—p. 662.

Prognostic Significance of Age at Onset of Initial Attacks of Rheumatic Fever. Elvira M. DeLue, Katherine G. Dodge and C. McEwen.—p. 681.

Tongue Sign for High Venous Pressure. A. M. May.—p. 685.

Phonocardiogram in Spontaneous Interstitial Emphysema of Mediastinum. A. M. Hoffman, F. W. Pohors and R. Merhs.—p. 686.

Aneurysm of Pulmonary Artery: Report of Case in Which Aneurysm Apparently Developed Under Observation. A. S. Hartwell and I. L. Tilden.—p. 692.

Staphylococcus Aureus Septicemia, with Osteomyelitis, Pneumonia and Acute Purulent Pericarditis: Case Report. R. R. Impink, E. Denhoff and J. B. Vander Veer.—p. 699.

Capillary Studies in Migraine.—Redisch and Pelzer studied changes in the capillaries of the body surface of 118 patients in the Migraine Clinics at Bellevue Hospital and New York University College of Medicine. Repeated observations were made on 98 patients. Observations made during migraine attacks indicated the occurrence of a regular tendency to indistinctness or "blurring" of the capillary outline; this was less definite during the interval between attacks. Blurring was found to be present during migraine attacks and absent or diminished during the headache free interval in over three fourths of the cases. The state of visibility varied even during the period of a single observation. The peripheral capillary effect of an intravenous injection of 0.25 and 0.5 mg. of ergotamine tartrate during the migraine attack was watched under the microscope, and photographs were made in 23 instances among 16 patients. Two to five minutes after the injection the original "blurring" tended toward alternation between clearing and indistinctness. During this interval pronounced variations in diameter also took place. The indistinctness tended to increase with nausea. Eight to fifteen minutes after the injection the capillaries appeared much clearer and narrower, and subjective relief was simultaneously experienced by the patient. Subsequently the distinctness of the capillary outline again varied considerably. Thirty to forty-five minutes after the injection the loops again became blurred. The possibility that a disturbance in the water balance existed during the migraine attack induced studies on the water diuresis. Observations during migraine attacks induced by forced water ingestion seem to indicate a relationship between the fluid balance of the body, the state of the peripheral capillaries and the migraine attack.

Blood Pressure in Essential Hypertension.—Kapernick points out that a recent listing reveals almost 100 names of "hypotensive" drugs. The claim of "successful" treatment of essential hypertension often is based on symptomatic improvement rather than on a substantial reduction of the blood pressure. Some insist that symptomatic improvement is a sufficient end in itself, that reduction in blood pressure is undesirable

and that if the latter condition is established the patient may suffer. Some observers believe to the contrary that reduction of blood pressure is the essential aim of treatment. The fact that symptoms of hypertension can be controlled in many ways and that with excellent symptomatic control available the mortality rate has not been reduced suggests that symptoms associated with hypertension do not measure any factor contributing to death of these patients. The author studied the effects of a number of widely recommended drugs on patients in a state hospital for the insane. Few of these patients complained of symptoms of elevated blood pressure, although some were ill from the consequences of it. The patients included those with schizophrenia, manic depressive psychosis, depression, arteriosclerosis of the vessels of the central nervous system and other types of mental disturbances. All patients were hypertensive men, with ages ranging from 38 to 70 years. All patients ate the same meals and were subjected to much the same environment and routine. Among the drugs experimented with were theobromine, a prepared combination of theobromine and phenobarbital sodium (thecominal), an arterial antispasmodic agent (iocapral), aminophylline, erythrol tetranitrate, hepvise (a synergistic combination of Viscum album [European mistletoe] and hepatic and insulin free pancreatic extracts) and allimin, which is stated to be a synergized combination of garlic concentrate and parsley concentrate. This study demonstrated that these drugs administered continuously in optimal dosage for periods of thirty days failed to exhibit any significant hypotensive effect on the blood pressure of hypertensive patients. A sustained, significant reduction in blood pressure was not noted in a single instance.

Subarachnoid Hemorrhage Caused by Intracranial Aneurysm.—Sahs and Keil direct attention to the fact that the term "spontaneous subarachnoid hemorrhage," which has been used for many years to designate meningeal bleeding of nontraumatic origin, is confusing and meaningless and should be discarded. In the majority of instances such conditions as ruptured intracranial aneurysm, extension of a massive cerebral hemorrhage into the subarachnoid space, hemorrhage from a neoplasm, meningeal inflammation or a blood dyscrasia can be established as the cause. The authors review the clinical features in 64 cases in which a diagnosis of subarachnoid hemorrhage caused by ruptured intracranial aneurysm was made. The presence of an aneurysm was verified by postmortem examination in 12 instances. The etiologic factors commonly given are congenital weakness of vessel walls, arteriosclerosis, inflammation and trauma. The authors feel that long standing structural weakness of the vessel wall plus the mechanical factors induced at bifurcations offers a logical explanation for the majority of these aneurysms. This is a disorder of middle adult life, although bleeding may occur at any age. The most consistent symptom is sudden onset of pain in the head. The symptoms and signs of meningeal irritation make their appearance soon afterward. The presence of blood in the spinal fluid is a valuable aid in diagnosis. Case reports are included to show variations in the clinical manifestations. Of the 64 patients examined, 18 died in the hospital, 22 were discharged well and 24 were improved but were left with sequelae such as hemiplegia, ocular palsy, aphasia and visual field disturbances. The prognosis must be guarded in every case. Recurrences often take place. The mortality is higher in older persons and in patients who have arterial hypertension. The treatment is principally symptomatic. Rest in bed and sedatives are necessary during the acute phase. Avoidance of undue excitement is indicated. Repeated lumbar punctures are of doubtful efficacy. Some of the patients with large, localizable aneurysms can be improved or cured by surgical means.

American Journal of Clinical Pathology, Baltimore

13:569-626 (Nov.) 1943

Morphology and Pathogenesis of Hepatic Cirrhosis. H. T. Karsner.—p. 569.

Metaplasia of Prostatic Epithelium: Lesion Sometimes Mistaken for Carcinoma. E. B. Sutton and J. R. McDonald.—p. 607.

Criticism of Methods Presented by C. A. Hellwig. J. Beeman and N. A. David.—p. 616.

Reply to Beeman and David. C. A. Hellwig.—p. 618.

American J. Obstetrics and Gynecology, St. Louis

46:623-772 (Nov.) 1943. Partial Index

- Consideration of Certain Factors Pertaining to Control of Carcinoma of Cervix. N. F. Miller.—p. 625.
- *Some Determinants of Maternal and Plasma Vitamin C Levels. C. J. Lund and M. S. Kimble.—p. 635.
- *Low Dosage Irradiation in Treatment of Amenorrhea. C. Mazer and R. Greenberg.—p. 648.
- *Use of Hypnoidal State as Amnesic, Analgesic and Anesthetic Agent in Obstetrics. W. S. Kroger and S. T. DeLee.—p. 655.
- Basal Metabolic Rate, Basal Body Temperatures, and Ovarian Cycle. W. W. Williams.—p. 662.
- Transfer of Sodium Across Human Placenta. A. Gellhorn, L. B. Flexner and L. M. Hellman.—p. 668.
- Rectal Stricture Complicating Labor. I. H. Kaiser.—p. 672.
- Ectopic Pregnancy. D. M. Farrell.—p. 686.
- Intrinsic Risk of Breech Delivery. P. Tompkins.—p. 695.
- Gestational Neuritis, Deficiency Disease. A. C. Posner.—p. 700.
- Ectopic Decidua in Vermiform Appendix. S. Sanes and A. F. Libber.—p. 719.
- Recovery After Cesarean Hysterectomy. L. D. Odell.—p. 722.
- Uterine Apoplexy Following Elective Second Cesarean Section. S. C. Hall.—p. 734.
- Choriocarcinoma with Regression of Primary Uterine Tumor. M. E. Maun and W. M. Green.—p. 738.
- Use of Willett Clamp for Scalp Traction in Delivery. D. F. Kaltreider and H. B. McNally.—p. 744.
- Axial Torsion of Gravid Uterus in Two Successive Pregnancies. J. E. Corr.—p. 749.

Maternal and Plasma Vitamin C Levels.—Lund and Kimble determined the vitamin C content of more than 500 samples of blood obtained from 197 women at different stages of pregnancy. Most of the samples came from a group of 46 women who were studied three or more times throughout pregnancy. One hundred and fifty-one mothers were observed once or twice during pregnancy, and 110 of these mothers and their infants were observed at the time of delivery. The plasma vitamin C level reflects the dietary intake of this substance. The mean plasma value for mothers with an adequate diet was 0.95 mg., with a fair diet 0.52 mg. and with a poor diet 0.18 mg. per hundred cubic centimeters. During the summer months diets poor in vitamin C were uncommon (7 per cent). During the remainder of the year 20 per cent had poor diets. Optimal values can be maintained by diet alone. Fresh citrus fruits, tomatoes and berries are excellent sources of ascorbic acid, and at least one of this group of fruits should be eaten each day during pregnancy. Small doses of ascorbic acid, such as 25 mg. daily, are of little benefit alone. They may lead the physician into a false sense of security unless he realizes that the daily requirements of the pregnant woman are much greater. If the woman receives an adequate diet there is no need for synthetic ascorbic acid. Blood levels of vitamin C did not change during labor. They tended to be slightly lower during the early puerperium and were definitely but not alarmingly lower after delivery by cesarean section. Hyperemesis gravidarum may lead to dangerously low levels of vitamin C. Clinical scurvy may appear. The retinal hemorrhages of severe hyperemesis gravidarum are a manifestation of vitamin C deficiency and are similar to petechial hemorrhages seen elsewhere. These hemorrhages cease after adequate therapy with vitamin C; henceforth they are not necessarily an indication for the use of therapeutic abortion. The fetus receives its supply of vitamin C at the expense of the mother and, under fasting conditions, the fetal values are always higher than those of the mother, the difference being relatively greatest when maternal values are low. Fetal blood vitamin C may be maintained at a level higher than the mother's by a process of selective retention by the placenta.

Low Dosage Irradiation in Amenorrhea.—A follow-up for three years of 92 additional cases of amenorrhea treated with low dosage irradiation of the pituitary gland and ovaries revealed to Mazer and Greenberg that 65 (72 per cent) of these patients have been menstruating normally. Data gathered from a long term follow-up of 165 cases, similarly treated and previously reported, show permanence of the cures and safety of the procedure to both the patient and her offspring. Of the 92 amenorrheic patients in the present group, 54 desired offspring but had not conceived despite the intensive use of organotherapy and other measures for several years. Twenty-eight (54 per cent) of the 54 barren women conceived and carried to term healthy infants; 2 aborted during the first trimester of pregnancy. All the 30 women have been menstruat-

ing normally since the termination of pregnancy. Low dosage irradiation of the pituitary gland and ovaries for the relief of amenorrhea should not be administered without a preliminary pelvic examination and a dependable biologic pregnancy test, unless the patient happened to have menstruated a couple of weeks previously. Literature on low dosage irradiation of the pituitary gland and ovaries, as employed for the relief of amenorrhea, reveals no adverse effects either on the patients or on their offspring. Instances of harm recorded in the literature were the result of heavy irradiation employed in the treatment of uterine fibroids and kindred conditions. The importance of employing a uniform technic and dosage is emphasized, for the boundary line between the clinically effective and the injurious dose of roentgen rays has not been determined.

Use of Hypnoidal State in Obstetrics.—Kroger and DeLee believe that the only method of relief of pain in childbirth which has complete safety for mother and baby without altering the normal mechanism of labor is hypnosis. Since 1931 Kroger has successfully managed the entire course of eleven out of twelve confinements with this method. There was only one failure. Ten patients were primiparas and 1 was a multipara; the latter was delivered twice under hypnosis. Prophylactic forceps, episiotomy and perineorrhaphy were performed on all. The patient was placed in a deep hypnotic state before the seventh month of gestation. Posthypnotic suggestions were made to the effect that the labor would be entirely painless, that she would have no recollection of the entire procedure and that she would look forward to her confinement with a feeling of joy and happiness instead of dread and anticipation. Posthypnotic suggestions last about a month, and, when repeated often enough, the effect will become permanent. The patient returns every two weeks and the same suggestions are repeated to her in the hypnotic trance, which is a state of increased hypersuggestibility. It is imperative that the gravida maintain complete confidence and rapport with the operator. Suggestions must be dignified at all times. During labor, hypnotic sleep is induced when the cervix is dilated between 2 and 4 centimeters. The patient is told that her sleep will be deep and continuous. Also she will hear only the commands of the person placed in rapport with her. After careful preparation these women will be most cooperative during labor. They lie motionless and require no attention except routine care. The normal mechanism of labor is not interfered with and the gravida can be told to bear down with each contraction, thereby facilitating the completion of the expulsive stage. The respiration is diaphragmatic in type, the pupils are usually fixed and dilated. The limbs can be made cataleptic or flaccid during the delivery and complete relaxation of the entire body can be produced by command. Any type of operative delivery is facilitated. The hypnoidal state is a safe amnesic, analgesic and anesthetic agent. There are no untoward effects on the mother or baby.

American Journal of Surgery, New York

62:293-432 (Dec.) 1943

- Progress in Management of Hemorrhoids. E. T. Whitney and G. Angelo.—p. 296.
- Preoperative and Postoperative Treatment of Toxic Thyroid. F. E. Sanford.—p. 309.
- Effects of Pyridium in Certain Urogenital Infections. T. J. Kirwin, O. S. Lowsley and J. Menning.—p. 330.
- Prognosis in Prolonged Unconsciousness Following Head Injury. C. D. Hawkes.—p. 336.
- Pathogenesis and Experimental Therapy of Keloids and Similar Neoplasms in Relation to Tissue Fluid Disturbances. W. Marshall and S. Rosenthal.—p. 348.
- *Chlorophyll: Experimental Study of Its Water Soluble Derivatives in Wound Healing. L. W. Smith and A. E. Livingston.—p. 358.
- Implantation of Ureters into Large Intestine: Report of 2 Cases. R. S. Fowler.—p. 370.
- Knee Joint Arthroscopy in Military Life. B. B. King.—p. 382.
- Further Experience with Pilonidal Cysts at Fort Sill, Oklahoma. W. J. Pickett and M. P. Meyers.—p. 387.
- Tenosynovitis: Industrial Disability. J. V. Reed and A. K. Harcourt.—p. 392.
- Anisouria in Congenital Torticollis. S. Stone.—p. 397.

Water Soluble Derivatives of Chlorophyll in Wound Healing.—Smith and Livingston studied the healing effect on wounds of water soluble chlorophyll preparations made up as solutions, jellies and ointments in the treatment of experimentally induced burns and wounds in rats, guinea pigs, rabbits

and dogs and in a small number of clinical cases. The agents tested included chlorophyll (aqueous soluble derivatives) in five vehicles, vitamin A, vitamin B complex, vitamin C ointments, biodyne ointment, methionine ointment, Castilian malva infusion, sulfanilamide powder, sulfathiazole powder and ointment, sulfadiazine spray, scarlet red ointment and tetrodine dusting powder. The experiments fall into three groups: (1) the healing of experimentally produced clean surgical wounds, (2) the healing of experimentally infected surgical wounds and (3) the healing of experimentally induced dry heat burns. In each of the three groups there were carried out eighteen separate experiments with each type of animal used, based on the seventeen preparations under study. In the small animals a single test area was used with a corresponding control area on the opposite side. In dogs eight lesions were produced, two of which served as controls and six as test areas. The total number of wounds and burns studied amounted to 1,372, while the control series numbered 878 lesions. Chlorophyll preparations alone consistently showed statistically significant effects in accelerating the healing of both traumatic and thermal wounds. In 304 out of 448 lesions (67.9 per cent) wound healing was accelerated by 24.9 per cent in time. Vitamin B, C and D ointments showed no appreciable effect. Biodyne and methionine ointments and Castilian malva wet dressings (infusion) caused a slight acceleration of healing in somewhat less than a third of the cases, but of less than 10 per cent in time. The sulfonamide compounds caused definite retardation of the healing process except in the presence of active infection. Scarlet red ointment acted merely as a protective dressing similar to boric ointment or petrolatum gauze. Tetrodine, an active, stable, aqueous soluble iodine preparation (with an iodine content of 4 per cent combined iodine and 2 per cent free iodine) reduced the healing time in about half the cases when infection was present. In the absence of infection some slight delay in healing was found presumably because of minor tissue irritation. On the basis of these observations it is suggested that chlorophyll preparations should be used extensively in the treatment of wounds and burns.

American Journal of Tropical Medicine, Baltimore

23:569-628 (Nov.) 1943

- Annotated List of Bloodsucking Insects, Ticks and Mites Known from Panama. G. B. Fairchild.—p. 569.
Cultivation in Vitro of *B. Leprae* with Thiamine (Vitamin B₁) Culture Medium. W. L. Loving.—p. 593.
*Immunization Against Malaria: Increased Protection by Vaccination of Ducklings with Saline Insoluble Residues of *Plasmodium Lophurae* Mixed with a Bacterial Toxin. H. R. Jacobs.—p. 597.
*Histogenesis of Experimental Icterohemorrhagic Spirochetosis in Albino American Deer Mice (*Peromyscus maniculatus gambelii*). L. L. Ashburn and A. Packchianian.—p. 607.
Modification of N. N. Medium for Cultivating *Trypanosoma Cruzi*. N. Tom.—p. 615.

Immunization Against Malaria.—The water insoluble plasmodial residues of *Plasmodium lophurae* appear to contain antigens which stimulate the formation of protective antibodies in the duckling. The experiments presented indicate that antigens are present in plasmodial materials, but that they are either too insoluble or only partially antigenic or both. The notable increase in protective antigenicity wrought by the addition of a bacterial toxin supports the proposed hypothesis that plasmodial material contains a hapten antigen which (a) does not efficiently provoke antibody production and (b) combines with the protective antibodies that are formed. Immunity to malaria was probably not produced. The most that has been achieved is an increased protection. The way may have been cleared to the elaboration of a good vaccine. The next logical step is to render the useful plasmodial material more soluble. The role of the bacterial toxin is entirely hypothetical. Staphylococcus toxin was used because Burky and others showed that this substance, when combined with nonantigenic materials, served to make the latter antigenic.

Experimental Icterohemorrhagic Spirochetosis in Mice.

—Ashburn and Packchianian point out that until recently guinea pigs were the only known satisfactory experimental animals for the study of Weil's disease. Other American rodents are susceptible to infection with *Leptospira icterohemorrhagiae*. For this study 30 albino deer mice (*Peromyscus maniculatus gambelii*) were used.

The animals were inoculated intraperitoneally with a rat strain of *Leptospira icterohemorrhagiae* and were killed in groups at daily intervals from the second through the seventh day. Jaundice, internal hemorrhage and leptospiras in the blood were first noted on the fifth day. Jaundice and hemorrhage rapidly increased and were severe by the seventh day. Leptospiras were present in the blood in great numbers by the sixth day, but the number had decreased by the seventh day and 1 mouse (previously positive) was negative at this time. The renal cortex, mainly the inner portion, showed progressive changes in the tubular epithelium, including cytoplasmic swelling, dispersion of granules, nuclear enlargement, indistinctness of brush border and, in late stages, lack of adhesions between cells and focal necrosis. Interstitial cellular infiltration was slight and irregular. Pathologic alterations of the liver comprised cell enlargement, increase in number of cellular nuclei, swelling and oxyphilia of some Kupffer cells, necrosis of an occasional parenchymal cell, and disruption of liver cords due to loss of cohesion between cells. Erythrophagia was present on and after the fifth day and was progressive. In the spleen erythrophagia was prominent. Leptospiras were abundant in the liver, much less so in the kidney, and were present in very small numbers in the heart and lungs. The hepatic damage is sufficient to explain the occurrence of jaundice in experimental icterohemorrhagic spirochetosis in deer mice. Intrahepatic biliary obstruction was not observed.

American Review of Tuberculosis, New York

48:361-470 (Dec.) 1943

- Beginnings of American Antituberculosis Movement. J. A. Miller.—p. 361.
Analysis of Breathing Pattern. J. L. Caughey, Jr.—p. 382.
*Nutritional Studies in Tuberculosis: I. Prothrombin Deficiency and Vitamin K. J. E. Farber and D. K. Miller.—p. 406.
*Nutritional Studies in Tuberculosis: II. Niacin (Nicotinic Acid) and Riboflavin Deficiency. J. E. Farber and D. K. Miller.—p. 412.
Fluorescence Microscopy of *Mycobacterium Tuberculosis*: Study of Basic Factors. C. F. Graham.—p. 421.
Demonstration of Tubercle Bacilli by Fluorescence Microscopy: Comparative Evaluation of Fluorescence and Ziehl-Neelsen Methods in Routine Examination of Smears for Acid Fast Bacilli. D. G. Freiman and G. F. Mokotoff.—p. 435.
Autolysis of Tubercle Bacilli and Production of Tuberculin (Tuberculin protein). H. J. Corper and M. L. Cohn.—p. 443.
Treatment of Experimental Tuberculosis in Vaccinated and Nonvaccinated Guinea Pig with Promin. W. Steenken Jr., F. H. Heise and E. Wolinsky.—p. 453.

Prothrombin Deficiency and Vitamin K in Tuberculosis.—Farber and Miller made more than 700 determinations of the prothrombin time on 400 patients with pulmonary tuberculosis. Approximately 100 control tests were performed on normal persons. Prothrombin deficiency was found in 33 per cent of the nonbleeding and 53 per cent of the bleeding tuberculous patients. Synthetic vitamin K (menadione) restored the plasma prothrombin concentration but had no effect on the hemorrhage. Prothrombin deficiency reflects the clinical status of the patient and is a manifestation of a general nutritional deficiency.

Niacin and Riboflavin Deficiency in Tuberculosis.—Farber and Miller studied 400 tuberculous patients with regard to niacin and riboflavin deficiency. All patients had advanced pulmonary tuberculosis. When evidences of glossitis, stomatitis or cheilosis were noted the patient was selected for more careful study. This included gastric analyses, blood counts and serial prints and photographs of the tongue. About 100, or 25 per cent, of 400 patients with tuberculosis showed definite evidence of niacin and riboflavin deficiency. Fever and the accompanying elevated metabolism of active tuberculosis increase the body requirements of vitamins. In patients with enterocolitis there is impaired retention and absorption and rapid excretion of the essential nutrients. In patients with amyloidosis, particularly of the liver, there might be interference with the utilization of the vitamins. The loss of proteins in renal amyloidosis is also serious. Patients with tuberculous meningitis and other severe forms usually eat poorly and, with increased requirements incident to fever infection, develop deficiency syndromes. Some of the most pronounced niacin deficiency tongues were in this type of patient. The state of

nutrition of a tuberculous person can usually be correlated with the severity of the disease process. The treatment of vitamin deficiency must take into consideration the conditioning factor as well as the specific deficiency. The diet should be liberal and of high vitamin content. Adjuvants such as cod liver oil and tomato juice are valuable. In addition, specific therapy for the nutritional deficiency is indicated. With evidence of niacin deficiency, a minimum dose of 150 mg. should be given daily in divided doses. At least 1 ounce of brewers' yeast should be given three times a day to cover subclinical deficiencies of other portions of the B complex which might be present.

Archives of Internal Medicine, Chicago

72:709-814 (Dec.) 1943

- *Recurrent Lymphocytic Choriomeningitis Report of Case in Which Treatment Was with Pooled Normal Adult Serum. J. V. Treusch, A. Milzer and S. O. Levinson—p. 709
Effect of Roentgen Therapy on the Heart Clinical Study. J. E. Leach.—p. 715
Clinical Significance of Glycogen Content of Liver. M. Korenberg.—p. 746.
*Cardiovascular Manifestations in Pernicious Anemia J. B. Carter and E. F. Traut—p. 757.
Hypertension in Only One of Identical Twins Report of Case, with Consideration of Psychosomatic Factors M. Friedman and J. S. Kasanin—p. 767.
Myocarditis in Bronchiectasis O. Saphir—p. 775
Pernicious Anemia in Negroes S. O. Schwartz and M. Gore—p. 782.
Splenoportal Venous Obstruction Without Splenomegaly: Further Contribution to the Pathogenesis of Fibrocongestive Splenomegaly (Banti Syndrome). P. Ravenna—p. 786
Review of Neuropsychiatry for 1943. S. Cobb—p. 795

Lymphocytic Choriomeningitis Treated with Pooled Normal Serum.—Treusch and his collaborators report the clinical history of a student nurse aged 22 who had recurrent attacks of lymphocytic choriomeningitis. The virus was isolated from the spinal fluid obtained during the initial attack and again during the recrudescence. The patient subsequently had a strong concentration of both neutralizing and complement fixing antibodies for the choriomeningitis virus in her blood serum. The case showed several unusual clinical features, especially the clinical picture of an encephalomyelitis associated with absence of pleocytosis or other abnormal findings in the spinal fluid and an essentially afebrile course. Administration of pooled normal adult human serum in large amounts appeared effective in the control of both the first attack and the recrudescence of the disease. The presence of neutralizing antibodies against the virus of lymphocytic choriomeningitis was demonstrated in three of twelve random pools of normal adult human serum, while no complement fixing antibodies were detected.

Cardiovascular Manifestations in Pernicious Anemia.—Carter and Traut reviewed the histories of 300 authenticated cases of pernicious anemia from the standpoint of cardiovascular symptoms. There were 257 with and 43 without cardiovascular manifestations. In the presence of severe anemia it is impossible to segregate dependably patients with primary cardiovascular involvement. All the usual criteria of cardiovascular disease may occur solely as the result of anemia. These symptoms and findings are not restricted to any type of anemia or related to the severity of the anemia. Examination of the blood is essential for dependable differentiation. Cardiovascular manifestations often occur with hematologic decompensation and disappear after treatment or during a remission.

Archives of Ophthalmology, Chicago

30:585-706 (Nov.) 1943

- Peripheral Retinal Holes Without Detachment A. Knapp—p. 585.
Carbamoylcholine Chloride in Petrolatum K. C. Swan—p. 591.
Guides in the Operative (Cosmetic) Treatment of Nonaccommodative Concomitant Squint in Adults H. S. Sugar—p. 593.
Pupillary Reflex to Darkness. O. Lowenstein and I. Givner—p. 603.
Genetic Studies on Ectopia Lentis: A Pedigree of Simple Ectopia of Lens H. F. Falls and C. W. Cotterman—p. 610
Electrophoretic Studies on Serums of Patients with Ocular Disturbances. J. Bellows, J. Cooper and H. B. Bull—p. 621
New Ophthalmologic Impression Material. T. E. Obrig—p. 626.
Effect of Sulfonamide Ointment on Healing of Experimental Wounds of Rabbit Cornea C. Berens, P. F. de Gara and M. Ioutfallah—p. 631.
Influence of Prolonged Wearing of Meridional Size Lenses on Spatial Localization H. M. Burian—p. 645
Visual Impairment During Tryparsamide Therapy. W. B. Potter.—p. 669.

Archives of Pathology, Chicago

36:539-646 (Dec.) 1943

- Diaphragm and Diaphragmatic Hernia J. L. Bremer—p. 539
*Autopsy Study of Cerebral Malaria with Special Reference to Malarial Granuloma. R. G. Dhayagude and N. M. Purandare—p. 550
Spontaneous and Experimental Encephalitozoon Infection in Laboratory Animals T. L. Perrin—p. 559.
Toxoplasma and Encephalitozoon in Spontaneous and in Experimental Infections of Animals: Comparative Study T. L. Perrin—p. 568
Erosive (Mycotic) Aneurysm of Heart with Rupture. C. L. Pirani.—p. 579
Mechanism of Release of Colloid and Significance of Specific Crystalline Substance Demonstrated in Thyroid Gland Histologically. N. W. Popoff—p. 587.
Acquired Bicuspid Aortic Valve with Obliteration of the Commissural Raphe S. Koletsky—p. 602.
Abdominal Visceral Lesions Associated with Primary Disease of Liver. A. D. Pollack and I. E. Gerber—p. 608.
Experimental Atherosclerosis: V. Effect of Testosterone Propionate and Estradiol Dipropionate on Cholesterol Content of Blood and Aorta in Castrate Female Rabbits M. Bruger, I. S. Wright and J. Wiland—p. 612
Neuropathology of Malnutrition Associated with Prolonged Alcoholism. I. M. Scheinker and C. D. Aring—p. 615.
Diverticula of Colon in Rats Fed a High Fat Diet J. L. Wierda.—p. 621.
Hodgkin's Disease: Incidence, Distribution, Nature and Possible Significance of Lymphogranulomatous Lesions in Bone Marrow, a Review with Original Data P. E. Steiner—p. 627.

Cerebral Malaria and Malarial Granuloma.—Dhayagude and Purandare secured in the course of fifteen years a record of 97 cases of malaria in which autopsies were performed. In 55 of these malarial parasites were found in the capillaries of the brain. They were diagnosed post mortem as cerebral malaria. Fever and coma were present in 28. Other symptoms were paresis of limbs, aphasia, dysentery, pneumonia, rigidity of the neck and exaggerated jerks. The condition was confused with meningitis. In all 55 cases malarial parasites were found on necropsy. The external appearance of the brain was abnormal in 43 cases. The fact that in the remaining 12 cases the external appearance was normal indicates the necessity of carrying out a microscopic examination of the brain before ruling out cerebral infection. The most common abnormal change was the slaty gray discoloration of the brain substance. Microscopic examinations of sections of the brain showed the capillaries to be filled with malarial parasites and their pigment. In 2 cases minute punctiform hemorrhages were noticed in the subcortical region. In 5 cases subcortical areas of focal necrosis were seen. There was no evidence of glial proliferation. In 10 cases malarial granuloma was present. A typical malarial granuloma exhibits three zones; the older granulomatous nodules do not show these three zones. In them a central capillary is surrounded by a mass of nuclei of the neuroglial cells with little of the necrotic material. Plasmodium falciparum was the infecting type of parasite in the cases in which granuloma was noted. In the year of the epidemic only 1 of 15 brains showed malarial granuloma. The reason probably is that granuloma, which indicates a neuroglial response, takes some time to be produced and in an epidemic the patients die quickly. It is easy to imagine that the described lesions would provide the pathologic basis for mental disturbances designated as malarial psychosis.

Archives of Surgery, Chicago

47:517-614 (Dec.) 1943

- Cancer Associated with Acanthosis Nigricans: Review of Literature and Report of Case of Acanthosis Nigricans with Cancer of Breast Helen Ollendorff Curth—p. 517.
*Sickle Cell Disease with Special Regard to Its Nonanemic Variety. J. Bauer and L. J. Fisher.—p. 553.
Cuts Grafts. Application of Dermotome Flap Method: Its Use in Case of Recurrent Incisional Hernia. S. A. Swenson Jr., and H. N. Harkins—p. 564.
Penetrating Wounds of Heart: Routine of Management Based on Five Year Period of Personal Observation and on Five Personal Cases H. Nelson—p. 571.
Flexible Plastic Liquid Adhesive. D. Rosenberg—p. 583.
Progress in Orthopedic Surgery for 1942: Review Prepared by an Editorial Board of American Academy of Orthopaedic Surgeons: XI. Conditions Involving Spine and Thorax Exclusive of Those in Lower Part of Back. J. R. Cobb—p. 586

Nonanemic Variety of Sickle Cell Disease.—Bauer and Fisher report 7 cases of sickle cell disease which demonstrate various consequences of the constitutional sickle cell trait. Anemia is not an obligatory sign of sickle cell disease. Serious consequences may result from the circulatory stasis in the small

blood vessels rather than from the anemia. Anemia in sickle cell disease is explained as a consequence of the deterioration of the conglutinated distorted red blood cells that cause the circulatory stasis. Persons with the sickle cell trait are potential candidates for sickle cell disease with or without anemia. They are frequently representatives of a status degenerativus and are biologic liabilities. Many cases of sickle cell disease are not diagnosed correctly because the sickling phenomenon is not looked for. All Negro patients in both medical and surgical services should be tested routinely for sickle cell anemia. This demand is particularly made with regard to the armed forces.

Bulletin of Johns Hopkins Hospital, Baltimore

73:307-400 (Nov.) 1943

*Successful Ligation of Left Common Iliac Vein for Thrombophlebitis Complicated by Pulmonary Emboli. R. T. Shackelford and R. Whitehill.—p. 307.

Pantothenic Acid Deficiency in Swine, with Particular Reference to Effects on Growth and on Alimentary Tract. M. W. Wintrobe, R. H. Fellis Jr., R. Alayaga, M. Paulson and S. Humphreys.—p. 313.

Antibacterial Properties of Crude Penicillin. A. M. Fisher.—p. 343.

Fungistatic and Fungicidal Effect of Sodium Propionate on Common Pathogens. E. L. Keeney, with technical assistance of E. J. Santora and G. German.—p. 379.

Guillain-Barré Syndrome (Acute Infective Polyneuritis) with Increased Intracranial Pressure and Papilledema: Report of 2 Cases. F. R. Ford and F. B. Walsh.—p. 391.

Ligation of the Iliac Vein for Thrombophlebitis and Pulmonary Emboli.—Shackelford and Whitehill maintain that the danger to life from thrombophlebitis arises from the development of pulmonary infarctions. A patient with a pulmonary infarction caused by an embolus from thrombophlebitis is in real danger to his life, and therapeutic measures may justifiably be radical. Neither heparin nor dicumarol was available to the authors. They believe that greater success can be achieved by surgical procedures which isolate the site of embolus formation from the general circulation. They report a case of thrombophlebitis and pulmonary embolism which occurred in a soldier aged 28. Recovery followed ligation of the left common iliac vein at the inferior vena cava. There was little edema of the left leg before or after the ligation. Ligation of a vein above the site of thrombophlebitis is the most effective procedure in the prevention of pulmonary infarction. It seems to be more logical than the administration of an anticoagulant. It does not supply the whole answer to the problem, because a large percentage of pulmonary emboli arising from thrombophlebitis give no signs or symptoms and are thus not known to exist. The use of venography may reduce this number. Also the use of anticoagulants postoperatively in patients known to be susceptible to the development of thrombophlebitis may decrease the frequency of thrombophlebitis.

Canadian Medical Association Journal, Montreal

49:455-552 (Dec.) 1943

British-American-Canadian Surgical Mission to U. S. S. R. W. Penfield.—p. 455.

*Effect of Plaster Bandages and Local Cooling on Hemoconcentration and Mortality Rate in Burns. E. A. Sellers and J. W. Willard.—p. 461.

*March Hemoglobinuria. R. A. Palmer and H. S. Mitchell.—p. 465.

Internal Derangements of Knee Joint in Canadian Army (Overseas). D. W. MacKenzie and J. A. MacFarlane.—p. 472.

Intravenous Novocain for Analgesia in Burns (Preliminary Report). R. A. Gordon.—p. 478.

Evacuation of Crete, 1941. M. McRitchie.—p. 481.

Gold Therapy in Rheumatoid Arthritis. J. W. Graham and A. A. Fletcher.—p. 483.

Psychosomatic Medicine and General Practitioner. G. H. Stevenson.—p. 488.

Acute (Febrile) Polyarthritis in Army. G. C. Ferguson.—p. 492.

Conservative Treatment of Sinusitis in Children. G. E. Tremble.—p. 496.

Preliminary Study of Incidence of Intestinal Protozoa in Canadian Armed Forces. D. C. Bews and L. P. E. Choquette.—p. 501.

Antepartum Hemorrhage. H. B. Van Wyck.—p. 504.

Cancer of Larynx (With Observations on 103 Cases). A. A. Campbell.—p. 509.

Medical Classification of R. C. A. F. Groundcrew on Basis of Functional Requirements. F. A. L. Mathewson, D. R. Wilson, W. J. M. Cameron and B. F. Crocker.—p. 512.

and their legs were immersed in water at 100 C. for one minute. Hemoconcentration was followed by hourly hemoglobin and hematocrit readings. For the suspension and cooling experiment a 15 per cent burn was produced on the four legs of 4 dogs. Moistened gauze was loosely applied to the extremities. The limbs were then suspended and a current of air was directed over them. The body was well blanketed to conserve body heat. With a similar burn, using 11 control and 12 experimental animals, double walled rubber sleeves were applied to the four limbs, and water at 8 C. was circulated through the sleeving. A water pressure of from 5 to 20 mm. of mercury was developed within the envelop. Little hemoconcentration occurred in the animals treated by the immediate application of plaster. Of the untreated animals only 47.4 per cent survived, whereas of those that had been treated with plaster 94.5 per cent survived. The treated dogs showed no evidence of pain or discomfort after the effect of the anesthetic had passed off. When casts were removed after twenty-four hours the legs appeared normal, but soon blistering between the toes and swelling occurred in a manner similar to that of the controls. When the casts were removed after forty-eight hours some swelling occurred but never became prominent. Swelling was minimal after seventy-two hours. When the casts were removed after a longer period (up to eleven days) no swelling was observed, although the deep circulation was well maintained. When cooling was combined with a minimal pressure, as in the rubber sleeving experiment, a drop in skin temperature of 15 degrees C. was produced. The cooling with a varying pressure of from 5 to 20 mm. of mercury was continued for forty-eight hours; 9 of the 12 treated animals survived, and 4 of the 11 controls lived. A sustained light anesthesia was necessary during the entire period. When cooling was effected by passing a current of air over the moistened suspended limbs of the animals, 3 out of 4 dogs died. The most striking feature of these experiments is the reduction in mortality brought about by the immediate application of plaster bandages to burned extremities.

March Hemoglobinuria.—According to Palmer and Mitchell, march hemoglobinuria is a form of paroxysmal hemoglobinuria of unknown cause occurring in certain individuals after exertion in the erect posture. The appearance of blood stained urine is usually the only symptom, though in some cases there have been varying degrees of discomfort in the abdomen and lumbar region. Since early in 1940 there have been admitted to Canadian general hospitals overseas 4 cases of march hemoglobinuria in a total of over 75,000 admissions. Owing to its benign course, patients exhibiting the syndrome may not reach a hospital, and the incidence is probably greater than the figures would indicate. In an unselected group of 22 marathon runners Gilligan and Blumgart found 3 cases of frank hemoglobinuria and noted that 18 of the 22 men showed plasma hemoglobin values above normal at the end of a race. The authors report 2 cases of march hemoglobinuria, which were admitted in the last year. The pathogenesis of the syndrome is unknown, but a theory is advanced which suggests that the paroxysms are not due to increased hemolysis but to some unknown abnormality present during erect exertion interfering with the clearing from the plasma of the hemoglobin liberated in the normal destruction of senile erythrocytes.

Illinois Medical Journal, Chicago

84:349-402 (Dec.) 1943

Evaluation of Roentgen Studies in Heart Disease in Children. S. P. Dittkowsky and E. Rypins.—p. 367.

Sympathectomy in Treatment of Peripheral Vascular Diseases. G. de Takats.—p. 373.

Studies on Pathologic Physiology of Burns. H. Necheles and W. H. Olson.—p. 379.

The New "Illinois Mental Health Act." C. Sommer and H. H. Nierenberg.—p. 384.

*Treatment of Tetanus. L. Stern.—p. 387.

Torsion of Spermatid Cord with Unsuspected Testicular Tumor. J. H. Mohardt.—p. 389.

One Sided Spinal Anesthesia. D. L. Murphy.—p. 393.

Treatment of Tetanus.—Stern states that injection of antitetanic serum directly into the spinal cord of dogs arrests the development of tetanus, so that the animals recover fully and rapidly. Such favorable results are as a rule obtained only during the first twenty-four hours. A later application of this method frequently yielded less favorable results. The author

Effect of Plaster Bandages and Local Cooling on Burns.—Sellers and Willard attempted to reduce local fluid loss in dogs after superficial burns by cooling and elevation of limbs. The animals were anesthetized with sodium pentobarbital

saved a patient with tetanus by injecting antitetanic serum into the spinal cord by the suboccipital route and simultaneously into the blood. Similar results were obtained with this method in other cases. The intraspinal injection of antitetanic serum proved effective in horses with tetanus. From 10 to 20 cc. of antitetanic serum should be injected into the spine, by the suboccipital route of patients with symptoms of tetanus after preliminary withdrawal of an equal amount of spinal fluid. These injections can be repeated several times. The simultaneous injection of antitetanic serum into the blood is aimed at rendering innocuous the toxin circulating in the blood.

Iowa State Medical Society Journal, Des Moines

33:543-586 (Dec.) 1943

- Coronary Disease: Its Recognition and Management. H. L. Smith—p. 543
Use of Alloy Steel Wire as Suture Material. J. W. Dulm—p. 546
Extrarenal Azotemia Associated with Diabetic Acidosis. L. W. Swanson, L. E. January and O. D. Thatcher.—p. 548

Journal of Infectious Diseases, Chicago

73:93-172 (Sept.-Oct.) 1943

- Rectal Tuberculosis in Monkeys from Use of Contaminated Thermometers. J. T. Riordan—p. 93.
Attenuation and Toxin Production of Diphtheria Bacillus: VII. Studies on Separation and Analysis of Products of Synthesis in Diphtheria Culture Filtrates. A. B. Wadsworth and Mary W. Wheeler.—p. 95
Spectroscopic Investigation of Bacterial Toxins. II. Ultraviolet Absorption Spectrums and Fluorescence of Synthetic Products in Toxicogenic and Nontoxicogenic Diphtheria Cultures. A. B. Wadsworth and M. O'L. Crowe—p. 106.
Avirulent Strains of Pasteurella Pestis. E. Jawetz and K. F. Meyer.—p. 124
Sylvatic Plague Studies: IV. Inapparent, Latent Sylvatic Plague in Ground Squirrels in Central California. K. F. Meyer, R. Holdenried, A. L. Burroughs and E. Jawetz.—p. 144.
Effects of Inorganic Salts on Multiplication of Bacterial Viruses. H. Gest—p. 167.
Experimental Clostridium Welchii Infection: I. Oral Sulfonamide Therapy (Sulfanilamide, Sulfapyridine, Sulfathiazole, Sulfadiazine). Lucile R. Hac and Mary Lou Eilert.—p. 167.

Journal of Lab. and Clinical Medicine, St. Louis

28:1775-1914 (Dec.) 1943

- Production of Staphylococcus Antitoxin. J. B. Weaver, Mary Whelan Tyler and Doris K. Schuerman—p. 1775.
Human Plasma and Serum Toxicity. D. State and M. Levine—p. 1786
Effect of Sulfonamide Compounds on Antibody Response to Staphylococcus Toxoid. J. B. Weaver and Mary Whelan Tyler.—p. 1792.
Note on Cysts and Abscesses Induced in Rat by Injection of Oils. F. E. Emery and C. S. Matthews—p. 1795
Acute Dissecting Aortic Aneurysm: 2 Cases with an Antemortem Diagnosis in I. S. L. Zimmerman.—p. 1797
Explanation for Absence of Clotting in Bloody Cerebrospinal Fluid. M. J. Madonick and B. Newman—p. 1809.
Thrombophlebitis Migrants. M. Y. Swirsky and C. Cassano—p. 1812
Artificial Phospholipid Membrane, Semipermeability and Blood Brain Barrier. J. H. Weatherby.—p. 1817.
Studies on Detoxication of Organic Arsenical Compounds: IV. Protective Action of P-Aminobenzoic Acid Against Lethal Doses of Neoparsphenamine Without Inhibition of Trypanocidal Potency. J. H. Sandground and C. R. Hamilton—p. 1821
Absorption, Excretion and Distribution of Sulfamethazine (2 Sulfanilamido 4,6 Dimethylpyrimidine) in Man. J. K. Clark, F. D. Murphy and H. F. Flippin—p. 1828
Studies in Pharmacology of Mercury: III. Histochemical Demonstration and Differentiation of Metallic Mercury, Mercurous Mercury and Mercuric Mercury. W. C. Hand, B. B. Edwards and E. R. Caley.—p. 1835.

Human Plasma and Serum Toxicity.—State and Levine observed in the course of several thousand plasma transfusions at the University of Minnesota Hospitals reactions which called for a more detailed observation and experimentation. A group O patient developed chills, severe dyspnea and cyanosis following intravenous administration of 150 cc. of undiluted group A plasma. By all theoretical immunologic considerations this group A plasma should have been innocuous. This patient gave a positive skin test not only with the reacting plasma but also with three other group A plasmas and one AB plasma, but not with B or O plasmas. The patient was subsequently given 100 cc. of another group A plasma with resultant chills, cyanosis and dyspnea. Group O and group B plasmas given intravenously gave no reactions. The authors felt that dissolved A and B substances might be responsible for the phenomena described. They were able to obtain the purified A and B

substances from Witebsky, and they used this material to check their hypothesis. Patients sensitive to the A or B plasma by skin tests with repeated A or B plasmas and some AB plasmas are also sensitive by skin test to the purified substance. These patients are also sensitive to group A or B plasma or AB plasma administered by the intravenous route. They have reactions following the intravenous administration of the purified A and B substances. Patients displaying sensitivity do not necessarily have an allergic history. The effect of pooling on the response to administration of the plasma in sensitive individuals was studied. It was found that pooling is not a sure method of preventing reactions. The authors also have evidence that reactions may occur because of factors other than the A and B substances. They feel that the following may be the cause of reactions when the A and B substances are not involved: 1. The presence of allergens in the plasma or serum. 2. The presence of reagins in the plasma or serum. 3. The presence of pyrogens. 4. The presence of immunologic factors as yet unknown. They present case histories to illustrate these causes. They found the skin test with the plasma a good method of indicating sensitivity to the plasma in many of the cases and an aid in preventing transfusion reactions.

Journal-Lancet, Minneapolis

63:383-432 (Dec.) 1943

- Psychiatric Problem in War and Peace. J. C. McKinley.—p. 383
*Guillain Barre's Disease (Encephalomyeloculoradiculitis): Review of 33 Cases. A. B. Baker—p. 384.
War and Peace Neuroses. W. G. Richards—p. 398.
Convoy Fatigue and Traumatic War Neuroses in Seamen. D. Blain and Florence Powdermaker.—p. 402.
Employment of Mental Hygiene Principles in Improved Selection of Armed Forces. P. H. Heersma—p. 405.
Neuropsychiatric Emergencies. P. K. Arzt—p. 409
Differentiation of Functional and Organic Neuropsychiatric Conditions. W. A. Carley.—p. 415

Guillain-Barré's Disease.—According to Baker the symptom complex referred to as Guillain-Barré's syndrome has been recognized since 1892, when Osler first described it under the term of "acute febrile polyneuritis." Since that time cases have been described under a variety of terms, such as radiculoneuritis, acute ascending paralysis, acute infective polyneuritis, infective neuritis, polyneuritis with facial diplegia, myeloradiculitis, neuronitis, myeloradiculoneuritis and encephalomyeloradiculitis. Since this disease seems capable of involving almost any part of the nervous system and the resulting clinical symptoms are most variable, the differentiation from variants of already well known neurologic disorders is difficult. For the present it would be best to retain the term Guillain-Barré's disease. The characteristic features of this disease are (1) the rather sudden onset, occasionally preceded by some antecedent infection, chiefly of the respiratory passages, (2) the absence of those findings suggestive of a septic or toxic reaction in spite of the severe clinical symptomatology, (3) a cell-protein dissociation in the spinal fluid with a normal cell count and a high protein, (4) radicular involvement, (5) facial nerve palsy, (6) absence of mental symptoms even in the presence of a very severe illness and (7) a favorable prognosis, usually with fairly good functional recovery. The author reviews 33 cases of Guillain-Barré's disease, including 2 fatal ones in which complete postmortem examinations were obtained. The author differentiates five types, depending on the region of the nervous system most severely involved. These are (1) the abortive or mononeuritic, (2) the polyneuritic, (3) the myelitic, (4) the bulbar and (5) the cerebral types. The myelitic form is the most frequent, occurring in 45 per cent of the author's patients as compared to 24 per cent with mononeuritic symptoms and but 21 per cent with polyneuritic symptoms. Severe radicular pain and muscle tenderness, a normal or only slightly elevated temperature and leukocyte count, cell-protein dissociation in the spinal fluid, facial palsy and a favorable prognosis in spite of an apparently severe illness are the features which greatly aid in the diagnosis. In spite of the apparent optimistic outlook, follow-up studies of old patients indicate that neurologic residuals occur frequently. This disease occurs predominantly during the winter months, although scattered cases may be seen throughout the year. The histopathologic changes consist of

perivascular foci of demyelination scattered throughout the cerebral hemispheres, neuronal alterations within the cranial nerve nuclei, and patchy areas of myelin destruction within the peripheral nerves. The perivascular distribution of the cerebral lesions suggest a hematogenous spread of the noxious agent.

Kansas Medical Society Journal, Topeka

44:397-428 (Dec.) 1943

- Serious Gunshot Wound of Hip. M. E. Pusitz and R. M. Taylor.—p. 397.
"Screw Worm" Infestation of Ear. R. R. Melton and F. W. King.—p. 401.

Kentucky Medical Journal, Bowling Green

41:397-492 (Dec.) 1943

- Minutes of Ninety-Third Annual Session of Kentucky State Medical Association Held at Louisville October 5, 6, 1943.—p. 399.

Maine Medical Association Journal, Portland

34:231-252 (Dec.) 1943

- Present Day Difficulties of Medical Practice and Licensure. A. P. Leighton.—p. 231.
Discussion of Section XI, Title IX, Social Security Act. A. G. Eustis.—p. 236.

Michigan State Medical Society Journal, Lansing

42:929-1022 (Dec.) 1943

- Prognosis of Poliomyelitis and Treatment of Commonly Fatal Types. J. L. Wilson.—p. 955.
Sulfadiazine Agranulocytosis. R. A. Hettig and C. C. Sturgis.—p. 959.
Infections of Heart. R. F. Weyher.—p. 962.
Anticoagulants—Heparin and Dicumarol. C. R. Lam.—p. 968.

Heparin and Dicumarol.—Lam presents results of four years' experience with heparin and dicumarol in the treatment of thromboembolic disease. The mode of action of the two substances differs. The administration of dicumarol does not result in an immediate effect on the clotting mechanism; about two days must pass before the supply of prothrombin on hand is used up. Heparin, on the other hand, acts immediately on the whole preformed supply, inactivating it for two to three hours when a single dose is administered. The author treated 71 patients with heparin, 56 of whom had pulmonary infarction. Other conditions treated with heparin included phlebitis, mesenteric thrombosis, arterial thrombosis of the leg, senile arterial occlusion and septic thrombophlebitis. Heparin was also used in arterial embolectomy and in ligation of the common carotid artery. Dicumarol was given by the author to 18 patients: to 11 with postoperative pulmonary infarct, to 3 with coronary occlusion and pulmonary infarct, to 1 with phlebitis and to 3 patients prophylactically after operation. The author concludes that these anticoagulants are of value in the prophylaxis of pulmonary embolism and in arterial surgery, phlebitis, mesenteric thrombosis and other conditions in which it is desirable to inhibit intravascular clotting.

New England Journal of Medicine, Boston

229:737-766 (Nov. 11) 1943

- Endocrine and Pseudoendocrine Problems in Childhood. R. Wagner.—p. 737.
Functional Urinary Incontinence in Women: Report of 23 Cases Treated by Kennedy Operation. L. E. Phaneuf, R. J. Heffernan and S. C. Kasdon.—p. 743.
Actinomycosis of Chest with Spread to Abdomen: Report of Case Cured with Sulfadiazine. W. E. Ladd and A. H. Bill Jr.—p. 748.
Plasma Proteins: Their Importance in Clinical Medicine and Surgery. C. A. Janeway.—p. 751.

229:767-798 (Nov. 18) 1943

- Medical Profession's Responsibility in Prevention of Blindness. H. B. C. Riemer.—p. 767.
*Therapeutic Value of Testosterone Propionate in Angina Pectoris. S. A. Levine and W. B. Likoff.—p. 770.
Treatment of Rheumatoid Arthritis with Gold. A. Cohen and A. W. Dubbs.—p. 773.
Plasma Proteins: Their Importance in Clinical Medicine and Surgery (concluded). C. A. Janeway.—p. 779.

Testosterone Propionate in Angina Pectoris.—Testosterone propionate in doses of 25 mg. was given three times weekly to 18 patients with typical angina pectoris for four weeks and to 1 patient for seven weeks. All but 2 patients received no other medication and continued the daily routine

to which they had been accustomed. Of the 19 patients, 9 were hypertensive and 1 had rheumatic aortic stenosis and insufficiency. Five had had a previous coronary occlusion. Results were judged by the amount of physical activity necessary to produce an attack of angina and the number of glyceryl trinitrate tablets used daily. Five were much improved at the conclusion of the treatment. Two reverted to their former clinical state within six to eight weeks, 1 obtained no relief from a second series of injections after fifteen months of comparative comfort, and 1 has been followed for only one month. One patient was moderately improved, 2 were questionably improved and the remaining 11 obtained no benefit. No change in the blood pressure or electrocardiogram and no toxic effects were noted. Testosterone propionate does not appear to have any beneficial therapeutic effect in this disease.

229:799-854 (Nov. 25) 1943

- *Blood Pressure Determinations in Patients with Essential Hypertension: III. Evaluation of Sympathectomy Over a Three Year to Five Year Period. D. Ayman and A. D. Goldshine.—p. 799.
Socioeconomic Aspects of Disease: Community Study of Pulmonary Tuberculosis in Selectees. R. W. Hyde and D. Zacks, with assistance of L. V. Kingsley.—p. 811.
Treatment of Thermal Burns: I. General Outline. National Research Council.—p. 817.

Sympathectomy in Hypertension.—Ayman and Goldshine present a small series of patients with essential hypertension who have undergone a variety of sympathetic denervations and who have had the advantage of detailed controlled study. The controls consisted of special clinic study of the blood pressure, together with home blood pressure determinations by the patients themselves. These data lead to the conclusion that sympathectomy is the first therapy of essential hypertension that has been shown to produce in some cases a definite prolonged nontoxic lowering of the blood pressure. With this improvement in blood pressure the heart may gradually decrease in size, the electrocardiogram return to normal, the symptoms disappear and the incapacity be replaced by normal activity lasting at least five years. Angina pectoris may disappear. Successful sympathectomy did not result in constantly normal blood pressure levels in any case. Grade 4 patients did not respond regardless of the extent of the sympathectomy. Success was more constant in patients subjected to extensive denervation. The transdiaphragmatic type of splanchnicectomy with dorsolumbar ganglionectomy was the most effective. Some failures are only apparently so when judged by the standard clinic readings, whereas the home blood pressure method reveals real improvement. Therapy by sympathectomy should be considered in patients with essential hypertension in whom progressive elevation of the blood pressure is found or in whom beginning vascular damage is demonstrated. Control figures of blood pressure levels and variations should be secured, preferably in the ambulatory state. Brief periods of preoperative hospitalization do not afford proper data with which to compare postoperative results. In a disease that has existed for some years there is rarely an excuse for brief preoperative studies or emergency decisions.

New York State Journal of Medicine, New York

43:2239-2350 (Dec. 1) 1943

- Surgical Treatment of Plastic Induration of Penis (Peyronie's Disease). O. S. Lowsley.—p. 2273.
Reconstruction Following Complete Avulsion of Skin of Penis and Scrotum: Report of Case. L. E. Sutton.—p. 2279.
Eczema Vaccinatum: Report of Case. F. C. Combes and H. T. Behrman.—p. 2283.
Variations in Response to Diabetes to Insulin Therapy: Clinical Guides to Therapy. M. B. Handelsman.—p. 2287.
*Disparity in Blood Pressures in Both Arms in Normals and Hypertensives and Its Clinical Significance: Study of 1,000 Normals and 272 Hypertensives. B. Amsterdam and A. L. Amsterdam.—p. 2294.
Study of Cellular Respiration in Vivo with Spectroductometer and Some Hormonal Observations. L. Berman.—p. 2301.

Disparity in Blood Pressures in Both Arms.—The Amsterdams recorded bilateral blood pressure readings in 1,000 individuals with an apparently normal cardiovascular system and in 272 hypertensive patients. They detected disparities between both arms in 76.4 per cent of the normal persons and in 89.3 per cent of the patients with hypertension. The right brachial systolic blood pressure was higher than the left in

70 per cent of normal persons and in 84.4 per cent of hypertensive patients. In only 6.4 per cent of normal and 4.9 per cent of hypertensive persons was the left brachial systolic pressure higher than the right. Fifty-one per cent of all hypertensive patients had disparities between both arms ranging from 20 to 50 mm. of mercury. In the small number of cases in which the left brachial systolic pressure was greater than that of the right, the disparity was invariably a small one. Diastolic blood pressure disparities occurred in normal and hypertensive persons but to a much lesser degree than systolic differences. These blood pressure disparities were found in both sexes and in all adult age groups, with a tendency toward a slightly greater increment in each successive decade. The degree of blood pressure disparity in hypertensive patients roughly increases with the degree of hypertension from an average disparity of 16 mm. of mercury in pressures of 150 to 170 mm. to an average of 41.6 mm. in those with blood pressures of 230 mm. and over. Significant and at times amazing systolic pressure disparities between both arms are common and should dispel the long-standing clinical fallacy of regarding such differences as strongly indicative of aortic aneurysm. A knowledge of these differences is of great importance in the standardization, diagnosis and prognosis of blood pressure abnormalities. The importance of routinely recording all blood pressure observations on both arms, using the right as the standard, cannot be over-emphasized. The cause for such blood pressure disparities between both arms in normal persons is usually inherent in the anatomy and dynamics of the aortic arch and its branches.

North Carolina Medical Journal, Winston-Salem

4:497-536 (Dec.) 1943

Some Rhinolarlyngologic Tumors of Unusual Clinical Interest: Small Series Presenting Infrequent Character, Difficulty in Management or Both V. K. Hart.—p. 497.

Can Organized Medicine Alone Stay the Tide Toward Socialized Medicine? N. T. Ennett.—p. 507.

*Acidosis in Newly Born Infants. R. B. Lawson and W. L. Venning Jr.—p. 510.

Unsuspected Prevalence of Intestinal Parasites in North Carolina. W. N. Sisk.—p. 513.

"De Humani Corporis Fabrica" (1543-1943). J. C. Trent.—p. 517.

Approved Laboratories in North Carolina. Nell Hirschberg.—p. 519.

Acidosis in Newborn.—Lawson and Venning believe that closer regard to the acid-base balance in newborn infants will be rewarded by a reduction of neonatal deaths, many of which are now recognized to be due to acidosis. Normal infants during the first few days of life have a relatively low carbon dioxide combining power—the so-called acidosis of the newborn. It resembles closely the change of acid-base balance associated with fasting and dehydration, being essentially a relative increase of organic acids and a decrease in the carbon dioxide content of the blood. The average infant, with the onset of a regular and adequate intake of milk, adjusts this abnormality over a period of days. Of the 7 infants who are the subject of this report 4 may be classed as "premature" or "immature" as regards their weight. These infants had the lowest carbon dioxide combining powers. The clinical picture of acidosis in newborn infants is not that typically seen in older-children. The typical Kussmaul type of breathing is not present. There may be merely rapid, shallow respirations. The diagnosis of acidosis may be suggested instead by failure to gain weight, listlessness or resistant dehydration. The use of isotonic solution of sodium chloride, even when repeated, apparently is not enough to bring an infant out of acidosis or to prevent its occurrence. Sixth molar sodium lactate solution will result in prompt and dramatic clinical improvement. Before sodium lactate solution is given, calcium should be administered in order to prevent the occurrence of tetany. It must be recognized that, particularly in premature infants, severe acidosis may occur after several days or weeks of apparent thriving.

Northwest Medicine, Seattle

42:345-378 (Dec.) 1943

Malingery in Relation to Psychopathy in Military Psychiatry. M. M. Campbell.—p. 349.

Industrial Medical Relationships. O. J. Johnson.—p. 354.

Industrial Hygiene in Washington. L. M. Farner.—p. 358.

Amebiasis and Related Infections. E. C. Faust.—p. 360.

Thirty Cases of Peptic Ulcer. L. E. Jackson and D. Metheny.—p. 367.

Carcinoma of Breast in Male. W. A. Niethammer and W. B. Dublin.—p. 368.

Public Health Reports, Washington, D. C.

58:1701-1728 (Nov. 19) 1943

Effect of Topically Applied Sodium Fluoride on Dental Caries Experience. J. W. Knutson and W. D. Armstrong.—p. 1701.

Identification of First Stage Larvae of Puerto Rican Anopheles. H. D. Pratt.—p. 1715.

War Medicine, Chicago

4:549-658 (Dec.) 1943

Dengue: Observations on Disease as Seen in South Pacific Area. J. R. Cavanagh.—p. 549.

Pentothal Sodium Anesthesia in Neurologic Surgery. B. Woodhall, with technical assistance of Elizabeth Goodman.—p. 556.

Hypnosis in Treatment of Neuroses Due to War and to Other Causes. C. Fisher.—p. 565.

Physical Treatments of Acute Psychiatric States in War. W. Sargent.—p. 577.

Manual of Emergency Treatment for Acute War Neuroses. L. S. Kubie.—p. 582.

Management of Meningococcal Infections at Station Hospital, Fort Benning, Georgia. L. Ochs Jr. and M. Peters.—p. 599.

Hysterical Homonymous Hemianopsia with Hemiplegia and Hemianesthesia. S. G. Stewart, G. C. Randall and F. Regis Riesenman.—p. 606.

*Improvement of Visual and Other Functions by Cold Hip Baths. A. H. Steinhause and A. Kelso, with technical assistance of V. Reinhardt.—p. 610.

Minnesota Multiphasic Personality Inventory: Evaluation of Its Usefulness in Psychiatric Service of Station Hospital. C. W. Leverenz.—p. 618.

Improvement of Visual Function by Cold Hip Baths.

—Steinhause and his collaborators report observations on cold hip baths given to 47 men ranging in age from 17 to 45 years. Shortly after breakfast the subjects were given a series of tests. On experimental days the cold hip bath followed immediately. About two and one-half hours later the tests were repeated. On control days tests were given on the same time schedule without a bath. The self-administered hip bath is taken seated with the feet on a second stool, the thighs and legs being flexed. From a shower head connected by a flexible hose to a mixer valve, the lower part of the abdomen (umbilicus to groin) is sprayed three to five minutes with increasingly hotter water followed by a gradual change to tap coldness (45 to 65 F.) maintained five to fifteen minutes. Over-all time does not exceed twenty minutes. Each subject's comfort dictates the extremes of temperature and the speed of change. Symptoms of slight cramps or discomfort terminate the cold period. The tests concerned particularly the effects on the visual function. Telebinocular test cards were used to test visual efficiency, visual acuity, lateral muscle balance, perception of depth or stereopsis and critical fusion frequency. The effect on the psychomotor functions was tested by determining the number of taps which a subject could make on a telegraph key in ten seconds. The average of five such trials separated by fifteen second rest periods was taken as the performance. Reaction time was determined on equipment designed to test the reactions of drivers of automobiles. Physiologic changes were determined on 2 subjects for a total of six control and four bath days. Diastolic blood pressure rose consistently 6 to 10 mm. of mercury during the cold bath and remained elevated through the second test. The hematocrit showed a 2 to 3 per cent increase in volume of red cells. The other tests showed no significant changes. Observations for six to eight hours after the bath revealed in all observed persons a gradual return to prebath levels. The favorable effects persisted for at least six hours when no meal was taken in the interim. The authors never observed a "pay-off" period. A period of depression immediately following the bath was noted occasionally after extra long cold hip baths. Regularly, feelings of exhilaration were reported. Some subjects remarked that the visual field appeared brighter and that black objects looked blacker and white objects whiter. Ordinary over-all cold showers lasting two to three minutes occasionally produced a moderate improvement for a shorter time. Over-all showers of five minutes' duration were followed by depression of the functions studied. Apparently the greater loss of heat in an over-all shower more than offsets any advantages that may have been gained from the stimulation. The authors think that the effects of the cold hip baths are of sufficient significance to warrant their application in industry and in certain aspects of warfare.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Tuberculosis, London

37:101-132 (July-Oct.) 1943

- Thoracic Injuries; Role of General Surgeon in Forward Area. C. P. Thomas.—p. 103.
 *Smallpox Vaccination and Pulmonary Tuberculosis. R. Y. Keers and P. Steen.—p. 111.
 Bronchogenic Neoplasm in Boy of Ten. R. Jones, K. W. MacKenzie and E. Biddle.—p. 113.
 Pneumoperitoneum Combined with Artificial Pneumothorax and Phrenic Paralysis. R. Y. Keers.—p. 116.
 Polyserositis. H. Hannesson.—p. 117.
 An Unusual Complication of Gold Therapy. B. G. Ridgen.—p. 126.

Smallpox Vaccination and Pulmonary Tuberculosis.—

Keers and Steen describe an outbreak of smallpox in Glasgow in the summer of 1942 and later in the same year in Edinburgh and Fife. Many persons were vaccinated. Keers received requests from former patients of the sanatorium for advice as to whether, in view of their previous pulmonary infection, they should undergo vaccination. Those in Glasgow were advised to be vaccinated. As far as is known, none of those so advised suffered any ill effects. Later in the year 4 patients were admitted to the sanatorium, all of whom gave a history of vaccination followed almost immediately by the appearance of symptoms of pulmonary tuberculosis. It is impossible to draw any definite conclusion from isolated instances, but it would appear that there is sufficient evidence to justify the assumption that vaccination may cause a flare-up in a latent focus. The authors think that if the necessity for widespread vaccination should arise again it would be well to exercise special caution before submitting to vaccination patients with pulmonary tuberculosis.

Irish Journal of Medical Science, Dublin

214:551-582 (Oct.) 1943

- Retinal Hemorrhage, with Special Reference to Its Sources and Distribution. A. J. Ballantyne.—p. 551.
 Hyperventilation Syndrome. D. K. O'Donovan.—p. 564.
 *Malignant Disease of Ovary. T. Gallagher.—p. 573.

Lancet, London

2:625-656 (Nov. 20) 1943

- Patulin in Common Cold: Collaborative Research on a Derivative of *Penicillium Patulum* Bainier: I. Introduction. II. Raistrick.—p. 625.
 Id.: Biochemistry and Chemistry. J. H. Birkinshaw, S. E. Michael, A. Bracken and H. Raistrick.—p. 625.
 Id.: Preliminary Trial in the Common Cold. W. E. Gye.—p. 630.
 Id.: Biological Properties: Extended Trial in the Common Cold. W. A. Hopkins.—p. 631.
 Id.: Statistical Note. Greenwood.—p. 634.
 Interstitial Emphysema After Extraction of a Lower Molar. K. McFadyen.—p. 635.
 Tuberculosis Survey at a Mental Hospital by Miniature Radiography. W. E. Snell, J. F. MacMahon and F. R. G. Heaf.—p. 636.

2:657-688 (Nov. 27) 1943

- Excursus on Terminology of Statistical Experimentation. A. Wright.—p. 657.
 Surgical Cleanings from the Middle East. N. J. Logie.—p. 658.
 Relation of Lymphatic Glands to Immunity Against Tuberculosis. M. C. Wilkinson and R. J. R. Cureton.—p. 662.
 Gunshot Wounds of Elbow Joint. St. J. D. Buxton.—p. 663.
 Dust as Vehicle of Infection in Children's Wards. E. D. Hoare, J. R. O'Brien and A. G. Watkins.—p. 666.
 *Nutritive Value of Nitrogenous Substances in Potato as Measured by Their Capacity to Support Growth in Young Rats. Harriette Chick and Margery E. M. Cutting.—p. 667.

Nutritive Value of Potato.—Chick and Cutting investigated the relative nutritive value of wheat and potatoes. On a dry weight basis there is little difference between the calorific values; but, whereas bread contains 33 per cent of moisture, potatoes contain 75 per cent, so that more than 2½ times the bulk of the latter is required to furnish the same amount of energy. As a source of vitamins, potatoes are superior to wheat. Their content of vitamin B₁, riboflavin and nicotinic acid is of the same order; but, whereas wheat is devoid of vitamin C, potatoes are an important source. The potato has been the poor man's protection against scurvy. The potato

contains about half the amount of nitrogen present in wheat and about one-third to one-fourth the amount of protein. The value of a food as a source of nitrogen for the body's needs does not, however, depend only on the protein it contains, for the latter is broken down in the intestine, and from the constituent amino acids the body rebuilds its own proteins. Accordingly, if the foodstuff contains amino acids in addition to proteins, these have to be taken into account. The potato differs from the cereals in having about half of its nitrogenous substances in the simpler forms of amides, amino acids and purines. The value of the mixture of nitrogenous compounds in the potato for support of growth of young rats from the time of weaning was compared by the authors with those of wheat and of milk. The value of the nitrogenous substances in the potato for supporting growth of young rats was found somewhat greater than that of those in whole wheat. The nitrogenous substances of potato were found inferior in nutritive value to those of milk. A diet containing 9 per cent of tuberin, the soluble protein in potato juice, was equal in value to one containing 11 per cent of whole wheat protein but not equal to one containing 11 per cent of casein. Some portion of the non-protein nitrogenous substances in the potato complement the amino acids of its protein to produce a mixture of biologic value not less than that of the protein itself. The authors conclude that the mixture of nitrogenous substances in the potato has a value as high as that of wheat protein.

Medical Journal of Australia, Sydney

2:261-288 (Oct. 2) 1943

- Desert Sores. J. Devine.—p. 261.
 Treatment of War Injuries of Large Intestine. H. C. Barry.—p. 262.
 *Postmortem Delivery of Living Child by Mid Forceps. T. D. Hughes.—p. 264.
 Outbreak of Food Poisoning Due to *Staphylococcus Aureus*. C. B. Sangster and T. C. Constance.—p. 264.

Postmortem Delivery of a Living Child by Mid Forceps.—Hughes points out that postmortem deliveries reported in the literature were accomplished by cesarean section. He reports a case in which delivery was done by mid forceps nine to ten minutes after the mother had died. Death had taken place during the second stage of labor. A live child weighing 9 pounds 4 ounces (4,195 Gm.) was delivered without undue difficulty. The infant was pallid, but the fetal heart could be heard; oxygen was administered, the child's color improved and it cried without any further attempts at resuscitation and maintained a satisfactory condition thereafter.

2:289-308 (Oct. 9) 1943

- Medical Work in Its Varying Aspects and Life in General in North India. E. W. Gault.—p. 289.
 *Epidemic of Polyarthritides in the Northern Territory. J. H. Halliday and J. P. Horan.—p. 293.

Epidemic of Polyarthritides.—Halliday and Horan report on 105 soldiers admitted to two army hospitals in the Northern Territory between Nov. 1, 1942 and Jan. 31, 1943. Over some months prior to this period, patients with acute arthritic manifestations had been admitted. It was felt that the condition was one which had not been previously described. The term "acute polyarthritides" was applied to this entity because the predominant signs and symptoms were related to joints. It is an acute febrile disease characterized by a fleeting exanthem, mild fever, pain and swelling of the joints and tender enlargement of the lymph nodes. The disease runs a benign course of from one to four weeks, and complete recovery takes place. The etiology is unknown. One of the most striking features is the absence of severe constitutional disturbance. The average leukocyte count was 10,000. In the acute type of the disease the sedimentation rate of the erythrocytes was almost invariably increased during the active phase and tended to fall as the symptoms subsided. Agglutination tests with Proteus OX19 and OX2 and Brucella abortus gave no significant results. Cultures from tonsils and nasopharynx produced no significant departure from normal. Culture study of urine and stools yielded no pathogens. Sigmoidoscopy in 6 cases revealed a normal mucosa. Since dengue fever is the chief endemic and epidemic disease in the region, the described disorder might be an atypical form of dengue.

However, the clinical picture of the present syndrome differs in many respects from dengue fever. Further evidence against the syndrome being an atypical form of dengue fever is obtained from a consideration of the geographic distribution. Cases of typical dengue occurred constantly throughout the period under review, but there was no increase in the number of these cases in December when this epidemic reached its height. Many of the cases of acute polyarthritis came from areas in which no typical dengue fever occurred. Rest in bed during the active phase of the disease is advisable. The affected joints do not require immobilization. Mild analgesics, particularly at night, are helpful. During convalescence active movements should be encouraged and the patient assured that these will hasten complete recovery.

Revista de la Asoc. Méd. Argentina, Buenos Aires

57:705-768 (Sept. 30) 1943. Partial Index

- *Acute Amebiasis. J. M. Jorge, I. Goñi Moreno and A. R. Peralta.—p. 707.
Cardiac Hydatidosis. J. M. Jorge and P. M. Re.—p. 720.
Fractures of Head of Radius with Displaced Fragment. J. P. Reggi.—p. 740.
Arthrodesis for Paralysis of Deltoid Muscle: Personal Technic. J. Piñero Sorondo.—p. 746.
Litré Strangulated Diverticular Hernia and Peritonitis. A. Dujovich and M. Shraer.—p. 749.

Acute Amebiasis.—Jorge and his collaborators report a case of acute amebic abscess of the liver and acute peritonitis due to intestinal perforation. Emetine therapy and puncture of the abscess did not influence the course of the disease. A virulent vegetative hematophagous strain of *Amoeba histolytica* was identified in the pus, in the walls of the abscess from material taken at a necropsy and in the walls of small abscesses of the intestinal wall. This form of amebiasis is rare and is probably the result of association of a strain of ameba of increased virulence in the presence of local infection.

Revista Mexicana de Pediatría, México, D. F.

13:279-316 (Aug. 10) 1943. Partial Index

- *Therapy of Noma. R. H. Valenzuela.—p. 310.

Therapy of Noma.—Valenzuela reports recoveries in 6 cases of acute and subacute noma following local application of sulfathiazole and blood transfusion. Sulfathiazole was applied locally three or four times daily after the tissues had been washed with warm diluted solution of sodium hypochlorite. Sulfapyridine was given by mouth in doses of from 0.1 to 0.2 Gm. per kilogram of body weight. Transfusion was given in doses of 10 and 20 cc. of blood for each kilogram of body weight at intervals of three or four days.

Semana Médica, Buenos Aires

50:1035-1090 (Nov. 4) 1943. Partial Index

- *Bilateral Artificial Pneumothorax. C. A. Crivellari and C. A. Lamarque de Crivellari.—p. 1035.
Action of Bilateral Lumbar Sympathetic Anesthesia on Arterial Pressure. O. T. Grassi and S. E. Luchetti.—p. 1049.
Sulfanilamide in Pleurisy. E. Ferreira do Nascimento.—p. 1059.

Bilateral Pneumothorax.—Crivellari and Lamarque de Crivellari advocate a bilateral artificial pneumothorax for all types of acute and toxic pulmonary tuberculosis, provided the process is not hyperacute or hypertoxic. Extensive pulmonary lesions, cardiac weakness, increased sedimentation rate of the erythrocytes and pronounced diminution of the vital capacity constitute the contraindications. In patients with bilateral pulmonary tuberculosis, pneumothorax should be induced on the lung which shows the most recently developed lesions, provided the lesions of the opposite lung are subacute. Bilateral alternate pneumothorax is indicated in these cases if unilateral pneumothorax is not followed by partial spontaneous pneumothorax of the opposite lung and consequent healing of the lesions. Successive bilateral pneumothorax is indicated in bilateral involvement with collapse of the lung from unilateral pneumothorax. Simultaneous bilateral pneumothorax is indicated in bilateral tuberculosis with lesions of the same acuteness in the two lungs and when acute bilateralization appears in the course of unilateral pneumothorax. The course of bilateral pneumothorax is controlled by radioscopy. The most frequent complications of bilateral pneumothorax are (1) unilateral or

bilateral fibrinous or purulent pleurisy, (2) spontaneous or operative pulmonary perforation, (3) appearance of new lesions in the collapsed lungs and (4) anoxemia. To prevent complications, it is suggested that (1) bilateral pneumothorax should be practiced only on hospitalized patients, (2) air insufflations should be performed separately, on different days, at proper intervals, (3) repeated determinations of the vital capacity or of the time of voluntary apnea should be a routine and (4) the treatment should be given in sanatoriums located in low lands or in places slightly above the sea level. The author obtained good results in 3 out of 4 cases thus treated.

Archiv für Kinderheilkunde, Stuttgart

127:97-136 (Nov. 27) 1942.

- *Malignant Diphtheria Following Tonsillar Operations. G. Bonell.—p. 97.
Guillain-Barré's Syndrome During Childhood. M. Spira.—p. 103.
Paramorbillous Meningococci Meningitis. T. Brehme.—p. 110.
Myeloid Reaction in Abdominal Tuberculosis During Childhood. A. Braun.—p. 118.
Serum Polyneuritis. J. Stoldt.—p. 129.

Malignant Diphtheria Following Tonsil Operations.—

Bonell reports 4 cases of diphtheria that developed after operations on the tonsils. Three of the cases terminated in death. Three possibilities are suggested: 1. The children may have been in the incubation period of diphtheria and would have developed the disease even if they had not undergone the operation. 2. The removal of the adenoids or of the palatine tonsils had an unfavorable effect on the course of the diphtheria; it is possible also that the children were contact carriers of diphtheria bacilli and the operation produced the conditions for the pathogenic action of previously harmless pharyngeal saprophytes. 3. The diphtheria bacilli may have entered the pharynx after the operation. Every nasal or pharyngeal operation should be preceded by examining a smear for the presence of diphtheria bacilli. If such bacilli are found, the operation should be postponed until after active immunization has been carried out.

Zentralblatt für Chirurgie, Leipzig

69:1009-1056 (June 20) 1942. Partial Index

- Appendectomy and Cecum Mobile. V. Schmieden.—p. 1013.
Treatment of Uterine Strictures and Fistulas by Means of T Drain. O. Nordmann.—p. 1015.
Bone Cyst of Temporal Region as Metastasis of Cystic Adamantinoma of Lower Jaw: Remarks on Pathogenesis. H. Coenen.—p. 1020.
Resection of Kidneys. A. W. Fischer.—p. 1026.
Traumatic Hydronephrosis as Sequel of Skiptole Injury. E. Ruppanner.—p. 1030.
Surgical Technic for Removal of Renal Calculi. H. Boeminghaus.—p. 1034.
*Indications for Electroresection in Hypertrophy of Prostate. C. H. Schröder.—p. 1044.

Indications for Electroresection of Prostate.—Schröder practiced transurethral electroresection of the prostate in 230 cases during a period of nine years. The operation is indicated for a slight enlargement of the prostate, for median bar protrusions of an otherwise not greatly enlarged gland and in sclerosis of the sphincter or the neck of the bladder. In such cases electroresection produces favorable permanent results. Patients with moderate or great enlargements should be subjected to suprapubic prostatectomy when the general condition, renal function and other urinary functions permit this operation. Electroresection should be done in these types of hypertrophy if the renal function is inadequate, if stasis-induced damage exists or if the general condition or the circulatory or respiratory systems are impaired. In extreme cases of hypertrophy in which radical operation is no longer possible, correspondingly large amounts of tissue (25 to 45 Gm.) must be removed. This is readily accomplished by the Stähler-Heywalt apparatus, because the part of the gland to be resected is rendered bloodless by transurethral infiltration with epinephrine solution. For patients with pronounced hypertension, smaller doses of epinephrine should be used. In patients with urinary stasis the intervention should be carried out only after adequate preparatory treatment. The decision whether electroresection or suprapubic prostatectomy should be done depends not only on the condition of the patient but also on the surgeon and on his expertness in electroresection.

Book Notices

A Synopsis of Clinical Syphilis. By James Kirby Howles, B.S., M.D., M.M.S., Professor of Dermatology and Syphilology, and Director of the Department, Louisiana State University School of Medicine, New Orleans. Fabrikoid. Price, \$6. Pp. 671, with 123 illustrations. St. Louis: C. V. Mosby Company, 1943.

A celebrated British physician of a past generation once stated that he wrote a book on dermatology in order to learn more about the specialty. Incidentally, the book later ran through many editions. Perhaps Dr. Howles had this in mind in writing this book. There is no question of there being a place in the English literature for a concise, well written, well illustrated book on syphilis. This, however, is probably not the book. Some of its features are worth while, e. g. the chapter on organization of the syphilis clinic, including its social service aspects. Many other features give the reader the idea that it has been rushed through in a hurry, and, when that is done, errors are bound to creep in and the reviewer regrets to say that these are numerous throughout the book—so numerous that it is almost impossible to point them all out in a short review. One glaring fault that is noted throughout the book is the mentioning of different diseases in differential diagnosis and then either ignoring them or treating them in a very cursory manner. It may be worth while to point out some of the most obvious mistakes. On page 20 and in several other places the inference is given that syphilis may be carried from the father to the fetus with the mother escaping: "There are many instances in which the father has a demonstrably active syphilis but in which maternal syphilis cannot be demonstrated by any method, yet the child is born with all the stigmata of syphilis." Any syphilologist knows that such a mother, despite her negative serologic reaction, has a low grade type of syphilis. On page 27 it is stated that deliberate inoculations which would be necessary to prove the occurrence of superinfection in human subjects are obviously not practical. Despite Dr. Howles's statement, superinfection has been carried out in human beings by Japanese workers and there is one form of superinfection that is well known in syphilis—the contraction of a super-infected disease on top of a congenital syphilis. On page 36 the statement is made that "the great majority of multiple chancres arise from contact between an infected surface and an apposing surface." Any one who knows his syphilis knows that this is impossible. On page 51 the incorrect bacteriologic term is used for the bacillus *Haemophilus Durey*. On page 53 the improper term is used for lymphogranuloma venereum. And, in connection with this disease, as well as throughout the book, one notices the tendency to employ the word "gland" for "lymph node." Page 59, l'Hôpital Saint Louis is incorrectly spelled. On page 63 the statement is made that "death from acute secondary syphilis, which was not at all unusual in the prearsenical era, practically never occurs today." Nor was it seen very often in the prearsenical era would be the rejoinder of the reviewer.

Perhaps syphilis is different in New Orleans from what it is in other parts of the United States, but cutaneous Herxheimer reactions occur frequently in macular syphilis. On the other hand the neurosyphilid of Unna is an exceedingly rare entity of macular syphilis. Moreover, the illustration of a macular syphilid on page 67 looks more like a papulosquamous syphiloderma than a macular syphiloderma. The author included himself in a group with Fournier and Hutchinson in believing that there is a vesicular acquired syphiloderma. In fact, he would lead the reader to believe that it is rather common, with which we do not agree.

On page 90 the statement is made that "relapsing secondary lesions may be of any type but are usually macular (neurosyphilids of Unna)." Once more we would have to disagree. The neurosyphilid of Unna is an exceedingly rare entity. And once again, on page 93, we would disagree with the statement "Vesicular eruptions are uncommon in syphilis but are by no means rare in Negro subjects." On page 126 the advice is given that dark field examination may be of value in tertiary syphilis. The reviewer has never encountered spirochetes from dark field examinations in tertiary lesions. On page 163 under "Other Diagnostic Tests for Syphilis" a paragraph is devoted to the

"spirochete complement fixation reaction" of Gaetgens. This test is not generally used, and the reviewer would question the advisability of including this in such a small book devoted to the essentials of syphilis. The same would also apply to the dermoluetin test on the next page. Figure 59, on page 167, designed to show spirochetes in liver tissue, is worthless. On page 174 the statement is made that malignant precocious teri-
arism is due to arsenical therapy having driven into the viscera the spirochetes which it did not kill. No mention is made of inadequate or irregular treatment as having anything to do with it. On page 225 the technic for bismuth injections is outlined. In the first place this technic is too time consuming, and in the second place it does not show the physician whether the needle has penetrated a blood vessel or not. Simply inserting a needle and watching it for thirty to sixty seconds to see if blood comes out would not always obviate emboli. No mention is made of the use of negative pressure by suction of the syringe attached to the needle.

When it comes to treatment of syphilis, the reviewer cannot agree with the author at all. Dr. Howles seems to have profound faith in the use of mercury, even in this day and age. In many of his forms of treatment therapy is begun with mercury. Even in acute syphilis, and even though the therapeutic index of mercury does not compare with that of bismuth or of arsenic, particularly of arsenic, he will depend on a course of mercury rubs rather than on the more potent bismuth injections between courses of arsenical therapy. Moreover, in late benign latent syphilis the author advises the use of arsenicals early, even though there would be danger of damage in the event of the patient having an uncomplicated syphilitic aortitis or a liver lesion. Likewise, his treatment of central nervous system syphilis does not agree with that of most workers. He does not seem to realize the value of fever therapy in these cases and, as far as malaria therapy is concerned, he apparently uses it but little; at least he knows nothing about the value of thiobismol to break the course of malaria therapy for a day or so in case of need. Why he recommends the use of silver arsphenamine in syphilis of the eye the reviewer does not know. On page 266, under "Syphilis of the Tongue—Primary Lesions," the statement is made that it may be difficult to identify the spirochete of syphilis on dark field examination, and biopsy or even culture of the organism may be necessary also. This is an incredible statement. On page 405 the statement is made that a spinal fluid may be considered normal as long as the total proteins are less than 60 mg. per hundred cubic centimeters. This statement is erroneous. Most textbooks feel that 30 up to 40 mg. per hundred cubic centimeters as a maximum would be normal. On page 433, treatment of optic atrophy, the advice is given for Swift-Ellis treatment weekly. Most physicians have given up the use of intraspinal therapy, and even the ones who do employ it do not employ it oftener than once in two weeks. On page 443 a short discussion is devoted to use of malaria in treatment of central nervous system syphilis. This discussion is very cursory, and the physician who desires some information with regard to the use of malaria would be disappointed with what he gets from this volume; e. g., during the chills the advice is given to take rectal temperature at two hour intervals. Furthermore, nothing is even mentioned about the necessity of frequent observations of the blood pressure during paroxysms. On page 536 the statement is made "Aortitis, aortic insufficiency, aortic regurgitation and even aneurysm may occur in congenital syphilis but are unusual, delayed manifestations, which many syphilitic children do not live long enough to develop." The reviewer disagrees entirely with this statement. These manifestations are practically never encountered in congenital syphilis. On page 585 is noted the statement that Noguchi in 1911 cultivated the spirochete of syphilis in vitro and reproduced the disease in experimental animals from the culture. As far as the reviewer knows, nobody has been able to cultivate a virulent *Treponema pallidum* that would reproduce the disease in experimental animals, e. g. rabbit testes.

The excerpts cited should indicate to the reader that this volume will require careful rewriting and revision before it will be a safe book to place in the hands of either medical students or physicians. It is not recommended in its present form.

Survey of Objective Studies of Psychoanalytic Concepts: A Report Prepared for the Committee on Social Adjustment. By Robert R. Sears, Professor of Child Psychology, Child Welfare Research Station, State University of Iowa, Iowa City. Bulletin 51. Paper. Price, \$1.25. Pp. 156. New York: Social Science Research Council, 1943.

This report discusses studies in which effort has been made to verify certain of the psychoanalytic concepts and suggests a further program for research. Professor Sears points out that Freud, dealing with problems of therapy, necessarily had to proceed independently of experimental psychology in the construction of his theories. Only in recent years have objective technics been developed for studying some of the aspects of behavior in which Freud was interested. The report covers studies pertaining only to concepts derived from early Freudian theory. Material relating to aggression has been excluded on the ground that Freud never formalized his theories of aggression in such a way as to give meaning to experimental data. Except for one study published in 1924 (*The Passing of the Oedipus Complex*) and reference to the 1933 edition of Freud's *Introductory Lectures*, all studies by Freud referred to dates earlier than 1916.

No attempt will here be made to review in detail the author's conclusions as to the extent to which psychoanalytic concepts are affirmed by objective studies. He emphasizes the great difficulties that exist in attempting to apply such "objective" methods to the study of the sort of things Freud studied. A typical example of such difficulty is that pointed out with reference to studies of childhood memories: "Recalls obtained in a classroom cannot be compared with those from the analytic couch or even from the quiet retrospection of a person who actively seeks his memories" (p. 109).

Sears feels that the objective studies support Freud's conception of infantile sexuality but not the relationship between erotogenic zones. The concepts of regression and fixation have been rather satisfactorily approachable through experimental animal psychology. Methods of investigation of learning are well developed. With respect to such mental mechanisms as repression and projection, nonanalytic methods merely demonstrate that these processes exist and can be measured. With respect to such mechanisms as inhibition, sublimation, reaction formation and projection, neither support nor refutation is derived from the objective studies.

This survey will be welcomed by all students of behavior, psychoanalyst and nonpsychoanalyst alike. Attempts to verify, test and disprove theories in any field are essential to development of the science. The author is obviously unable to say how much of psychoanalysis is "true." This is so because as yet there are no methods that permit "objective" scrutiny of many of the facts, or alleged facts, derived from psychoanalytic study. The author states that, by the criteria of the physical sciences, psychoanalysis is a bad science. This is obviously true, but by criteria appropriate to a science that investigates human behavior it may be the beginning of a good science. The author makes certain misstatements or, better, overstatements with respect to the unreliability of psychoanalytic observations. "Psychoanalysis relies upon technics that do not admit of the repetition of observation, that have no self-evident or denotative value, and that are tinctured to an unknown degree with the observer's own suggestions" (p. 133). The author overlooks efforts made to record psychoanalytic interviews accurately under conditions that permit comparisons between observations of different workers. Systematic further development of this procedure may go far to increase the reliability (from the standpoint of the objective investigator) of analytic observations. Correlation of psychologic observation with objective physical observation has been possible in appropriately conceived studies (e. g. Benedek and Rubenstein: *The Sexual Cycle in Women*, National Research Council, 1942).

The author concludes with suggestions for three types of research that give promise in the further development of a science of personality: longitudinal studies of growing personalities, further study of the influence of learning on motivation, and cross cultural comparative studies of personality development to help evaluate the social milieu as influence on determination of motivational and trait characteristics. He concludes finally that the social sciences "must gain as many hypotheses and intuitions as possible from psychoanalysis but that the

further analysis of psychoanalytic concepts by nonpsychoanalytic technics may be relatively fruitless so long as those concepts rest in the framework of psychoanalysis." This sound statement should serve as a stimulus to psychoanalytic and nonpsychoanalytic investigators alike to press further testing of old theories and concepts and, where need be, their replacement by those more serviceable.

Skin Grafting of Burns: Primary Care, Treatment, Repair. By James Barrett Brown, M.D., Lieutenant Colonel, Medical Corps, Army of the United States, and Frank McDowell, M.D., Assistant in Clinical Surgery, Washington University, St. Louis, Missouri. Fabrikoid. Price, \$5. Pp. 204, with 131 illustrations. Philadelphia, London & Montreal: J. B. Lippincott Company, 1943.

This manual, concerned chiefly with the late treatment of burns, is a timely and welcome addition to the already large literature on this important subject. The material consists of a clear, orderly and well illustrated description of the methods used in the author's service of plastic surgery at the Barnes Hospital. Only procedures and technics which have proved satisfactory in their large experience are given. No attempt is made to review the vast literature on the subject. The result is that an immense amount of valuable material is concentrated in a small volume, thereby making available to all surgeons explicit directions for treatment which can be easily followed. Much of the material heretofore has been available only in the original articles by the authors but now is assembled in this convenient form.

The first three chapters are devoted to the primary treatment of burns and shock and cover briefly the accepted present day treatment of recent burns. The several methods of local treatment, e. g. by means of pressure dressings, by closed or "sealing" methods and by tannic acid or dyes, are presented impartially. Following this is a chapter devoted to the pathologic physiology of the healing of tissues injured by heat.

The remainder and greater part of the book is given over to lucid and well illustrated descriptions of the use of the various types of skin grafts. The different grafts are considered individually, the indications and contraindications for their use given and the operative technic adequately described. Such matters as the preparation of the donor site, the optimum time for grafting, the postoperative care and dressings are considered in detail. A particularly valuable chapter is the one concerned with thick split-skin grafts, which have been popularized by the authors and which have proved so successful in their hands. The concluding chapters are concerned with some of the problems of reconstructive surgery for deformities in the several regions of the body, e. g. axillas, neck, extremities and face. Of especial interest at this time is the final chapter by Lieutenant Colonel Brown, which was written after he was called into military service and in which he recounts some of his experiences in the European theater of operations.

The authors are to be congratulated on having made available to the general profession the fruits of their large experience in the reconstructive surgery of burns and to have provided the excellent descriptions of technical problems in such a concise and easily understandable manner. This fund of information should be most welcome to surgeons in general and should prove a boon to the severely burned patient. Throughout the book the large number of excellent illustrations, consisting almost entirely of photographs of actual cases, adds immensely to the value of the book and enhances the clarity of the text. If any criticism of the book was to be made, it would be that the difficult art of skin grafting is made to appear extraordinarily simple and fool proof. The book should become one of the classic monographs on the subject of the treatment of burns.

The Epidemiology of Diphtheria During the Last Forty Years. By W. T. Russell. Medical Research Council Special Report Series No. 247. Paper. Price, 1s. Pp. 52, with 5 illustrations. London: His Majesty's Stationery Office, 1943.

Diphtheria mortality in England and Wales has declined only 60 per cent compared with 80 per cent in the United States. The significant decline in mortality under 5 years in ratio to that above 5 years among persons of the lower social grades in London is attributed to reduction in number of overcrowded areas and in size of families. There has occurred an age shift in the diphtheria mortality from preschool to school ages among the child population in London. This is due largely to the influence of the trend of the death rates in the lowest social

SURGICAL MENOPAUSE AND CARDIAC ARRHYTHMIA

To the Editor:—A woman aged 37 was operated on four years ago for ovarian cysts. The left ovary and three fourths of the right ovary were removed. For a year she did well, then began having irregular menstrual periods with headaches, nausea and dizziness. The flow was scanty; there was no discharge between periods. Last year she began to have a definite cardiac arrhythmia with dyspnea and mild cyanosis on the slightest exertion. These attacks have no relation to the menstrual flow and, I would say, occur three or four times weekly. I have sent her through a well known clinic where she was checked over thoroughly as regards heart, blood pressure, electrocardiogram, basal metabolic rate, roentgen examination of the chest, kidney tests, Wassermann reaction and analysis of the blood. All were reported normal symptoms due to a surgical menopause. However, she was having no arrhythmia at the time the electrocardiogram was made. Estrogenic substance and diethylstilbestrol have not been effective. I have used digitalis (tincture in 5 drop doses) with no success and phenobarbital $\frac{3}{4}$ grain (0.05 Gm.) morning and night, which helps a little. She is not neurotic or nervous. Could such symptoms be entirely due to a surgical menopause. Might there be some organic cardiac change? What is the present idea of the value of high voltage x-ray exposures to terminate menstruation? Are they carcinogenic? Can you recommend anything from the meager picture I have given?

M.D., Oklahoma.

ANSWER.—It is virtually impossible to answer the queries specifically and dogmatically, as much important information is not available. For example, it is not stated whether the patient is married, single, widowed or divorced or whether she has had any children. Nor is the dosage of estrogenic or of diethylstilbestrol stated. The described symptoms could be ascribed to the hormonal imbalance of a surgical menopause. But this does not prove that they should be so considered. For too many years and in too many cases has the climacteric been blamed for symptoms not obviously secondary to organic disease. It has been and is such a convenient explanation.

Despite the definite statement that the patient "is not neurotic or nervous," the benefit derived from small doses of phenobarbital is definitely suggestive of some psychic factor in the etiology. Psychosomatic manifestations frequently produce syndromes similar to that described (Weiss, Edward, and English, O. S.: Psychosomatic Medicine, Philadelphia, W. B. Saunders Company, 1943). A brief, frank, tactful but searching inquiry into the patient's possible anxieties might prove most revealing and profitable in explaining the somatic manifestations.

High voltage roentgen therapy to suppress further the little remaining ovarian activity hardly seems indicated. If the symptoms are due to the surgical menopause, such irradiation is more likely to induce an exacerbation rather than an abatement of symptoms. The carcinogenic potentialities of deep pelvic irradiation are not definitely established. It is highly doubtful that, properly administered, such irradiation has induced neoplastic growth in human beings. Animal experimentation has yielded conflicting results. Menorrhagia is a more logical indication for such therapy than the present syndrome. Certainly, before concluding that hormonal imbalance is not responsible, one must be certain that adequate amounts of estrogenic substance have been administered. Perhaps larger doses would be wise, but of this one cannot be sure, for there is no statement as to how much has already been used.

The clinic study, though made at a time when arrhythmia was absent, pretty effectively rules out gross organic disease of the heart. It does not, however, prove absent impairment of functional reserves, which can be accomplished only by the application of stress test procedures. For example, electrocardiographic study before and after exertion, the renal response to relative dehydration (concentration test) and a dextrose tolerance test. Acute episodes of hypoglycemia are a distinctly possible explanation of her acute attacks.

Not infrequently premenstrual intoxication, due to accumulation of the menstrual toxin (Macht, D. I.: *Am. J. M. Sc.* 206:281 [Sept.] 1943) is distinctly increased by scantiness of flow. This premenstrual intoxication usually responds well to the administration of acidifying salts for ten days prior to expected menstruation; 3 to 5 Gm. daily of ammonium nitrate, ammonium chloride or calcium chloride, all available in 0.5 Gm. enteric coated tablets, are often extremely effective. There is certainly no hazard in a trial of such medication as long as a liberal fluid intake is insisted on.

A last possibility is that the vagal and vasomotor phenomena are the expressions of an atypical migraine (Stieglitz, E. J.: *Am. J. M. Sc.* 189:359 [March] 1935). Paroxysmal tachycardia and, less frequently, arrhythmia due to premature contractions are sometimes cardiac equivalents of the classic migraine attacks with hemispheric cephalalgia, scintillating scotomas, nausea and vomiting. A search for migraine in the family history and in the past history of this patient is certainly indicated. Such episodes are most commonly precipitated by exposure to food allergens of fatigue. Evidence of other allergic reactions in the patient would increase one's suspicions in this direction.

The patient is deserving of further diagnostic study before much more therapeutic experimentation should be attempted.

BLEEDING FOLLOWING APPLICATION OF SULFONAMIDES TO OPEN WOUNDS

To the Editor:—In recent applications of powdered sulfanilamide and sulfathiazole on open wounds with any surface, I have found that it caused excessive bleeding. Can you give me any information on the cause for such bleeding?

Orville J. Lighthizer, M.D., Ashtabula, Ohio.

ANSWER.—The observation that the application of powdered sulfanilamide and sulfathiazole to surface wounds is followed by excessive bleeding has not been mentioned in the literature by others who have carried out the same procedure. Possibly such a sequence of events might arise if an excessive amount of the sulfonamides should be placed in a surface wound. Under this condition the drug would act as a foreign body interfering with the usual physiologic mechanisms, such as clot retraction. But there is no known specific action of the sulfonamides that would cause bleeding. Thrombocytopenic purpura is a rare toxic complication resulting from sulfonamide therapy. Under such a circumstance one might anticipate excessive bleeding in the wound, but probably there would also be evidence of hemorrhage elsewhere. In general, not more than 0.1 Gm. of sulfonamide per square inch should be implanted into a wound or applied to a surface area. Furthermore, sulfonamides should not be applied repeatedly to surface wounds. Such a practice often results in an avascular and poorly granulating tissue.

It is of interest that sulfapyridine has been stated to exert a hemostatic effect when applied to experimental wounds, and to oozing surfaces following tonsillectomy (Cunningham, B. P.: *Ann. Otol., Rhin. & Laryng.* 51:301 [June] 1942).

CONCURRENT ADMINISTRATION OF SULFUR DERIVATIVES AND SULFONAMIDES

To the Editor:—When sulfanilamide was introduced there was considerable publicity given to the contraindication of sulfonamides administered along with sulfur containing medicines. Since then this contraindication of sulfur and the sulfonamides has not been emphasized and other sulfonamides have largely superseded sulfanilamide. Is there a contraindication to the use of epsom salt or similar compounds with sulfadiazine? Is there a contraindication to intravenous injection of calcium thiosulfate along with the oral administration of sulfadiazine?

M.D., Florida.

ANSWER.—It is true that the earlier literature on sulfanilamide unduly emphasized the danger of sulfhemoglobinemia. It was presumed that the simultaneous administration of sulfanilamide and substances containing sulfur might lead to the formation of sulfhemoglobin. Epsom salt was particularly disfavored because its physiologic action was one of purgation followed by constipation, and during the ensuing period of constipation absorption of sulfates was most likely to occur. However, subsequent clinical investigations revealed that in practically all instances of cyanosis which resulted from the administration of sulfanilamide methemoglobin was present in the circulating blood, and only in extremely rare cases was an appreciable degree of sulfhemoglobinemia detected. It was further observed that cyanosis was less likely to occur following the use of the other available derivatives of sulfanilamide.

At the present time there is no contraindication for using foods or drugs containing sulfur along with sulfanilamide or any other available sulfonamide. There is no contraindication per se to the administration of epsom salt or similar compounds with sulfadiazine. Calcium thiosulfate should not be contraindicated for intravenous use when sulfadiazine is being prescribed orally.

METHODS OF PALPATION TO AVOID HAZARD FROM FLUOROSCOPY

To the Editor:—The danger of fluoroscopy, well known already, has been outlined again by Schatzki in the *New England Journal of Medicine*. He emphasizes that the palpating hand should never be in the direct beam of fluoroscopic light. How should that be avoided during the fluoroscopic study of the folds of the mucosa of the stomach and the bulb of the duodenum and when the physician wants to use compression? Which device would be satisfactory to eliminate this danger without impairing the diagnostic value of the examination?

M.D., New York.

ANSWER.—The examiner should never have his hands in the direct beam between the tube and the patient—for instance, palpate the patient in the horizontal prone position—during fluoroscopy.

Palpation in the direct beam but on the side opposite the tube is obviously much less dangerous but still should be avoided whenever possible by the use of compression cones, wooden spoons and palpation outside the shutter opening. If palpation is practiced within the field outlined by the shutter, a lead glove should be used.

The examiner should never have his hands in the actual direct beam (between the tube and the patient) even if his hands are protected by lead gloves.

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MUSCULAR PARALYSIS AND ELECTRO- CARDIOGRAPHIC ABNORMALITIES

RESULTING FROM POTASSIUM LOSS IN
CHRONIC NEPHRITIS

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During the past two years 2 patients suffering from chronic nephritis have had several admissions to the wards of the Massachusetts General Hospital, each having one admission to the neurologic service because of muscular weakness. The first patient on his original admission to the medical service was diagnosed as having chronic nephritis, and his next admission was to the neurologic service for severe generalized muscular weakness. The second patient was admitted originally to the neurologic service complaining of periodic attacks of weakness and stiffness of the extremities. The fact that significant kidney damage was present was not discovered until a phenolsulfonphthalein urinary excretion test was done several days later.

Disorders of the electrolyte balance in the blood are often manifest by symptoms pertaining to the skeletal musculature. Thus in Addison's disease and familial periodic paralysis there is muscular weakness, while in hypocalcemia, excessive chloride loss and hyperventilation alkalosis there are not infrequently muscular cramps or at least evidence of increased muscular irritability.

The 2 cases to be reported are to be compared with cases of familial periodic paralysis. This is a rare disease characterized by recurrent attacks of muscular weakness or paralysis not preceded by a sense of pain or stiffness in the affected muscles. The attacks subside spontaneously in a few hours or one to two days. The lower extremities are often affected first and experience the greater paralysis, while the muscles supplied by the cranial nerves are spared. Precipitating factors are observed by most patients, such as heavy meals, unusual muscular exertion, excitement or sleep. Extensive chemical studies of patients with this disease have been reported, and the striking observation has been the fall of serum potassium during an attack. Potassium salts have been observed to be of therapeutic value since 1902. That the derangement of potas-

sium metabolism is peculiar is indicated by the fact that the urinary excretion of potassium is not increased during an attack. Diuresis with water has, however, been demonstrated to induce attacks and to increase the loss of potassium in the urine.¹

In renal failure various authors have noted an accumulation of body potassium, and some have noted concomitant alterations in the electrocardiogram.² The electrocardiographic changes accompanying a rise of serum potassium are an increase in the amplitude of the T waves. This is followed by an impairment of intraventricular conduction and cardiac arrest when the serum potassium reaches about 10 milliequivalents per liter. A search of the literature, however, has not revealed instances of chronic nephritis associated with symptoms and electrocardiographic changes resulting from excessive loss of body potassium. The following 2 cases of chronic nephritis are therefore presented because of unusual neurologic symptoms and electrocardiographic abnormalities apparently resulting from such potassium depletion.

CASE 1.—J. E., a man aged 29, a mechanic, was admitted to the Massachusetts General Hospital in February 1941 complaining of swelling of the feet and ankles of three months' duration. During this time he had noted swelling of the face and eyelids on arising in the morning. There had been no history of a throat or other infection. Physical examination revealed that the patient was well developed and in no distress. The tonsils were enlarged, but the heart and lungs were normal to examination. The blood pressure was 150 mm. of mercury systolic and 95 mm. diastolic. The abdomen was normal, and the deep tendon reflexes were active. There was moderate edema over the lower part of the legs.

The laboratory studies demonstrated a hemoglobin of 17 Gm., a red blood cell count of 4.8 million, and a white blood cell count of 9,000 to 18,000, with a normal differential count. The urine examination showed a pH of 5.5 and a specific gravity between 1.008 and 1.020, with 4 plus albumin. The sediment was found to contain only occasional red blood cells and white blood cells, with a rare hyaline or granular cast. Blood chemistry studies revealed nonprotein nitrogen 17 mg. per hundred cubic centimeters, total protein 4.6 per cent, cholesterol 595 mg. per hundred cubic centimeters, and a total base of 150 milliequivalents per liter. The electrocardiogram was normal and is illustrated in figure 1. Repeated throat cultures were negative for beta hemolytic streptococci.

1. Mitchell, J. K.; Flexner, Simon, and Edsall, D. L.: A Brief Report of the Clinical, Physiological and Chemical Study of Three Cases of Familial Periodic Paralysis, *Brain* 25:109, 1902. Aitken, R. S.; Allott, E. N.; Castledon, L. I. M., and Walker, M.: Observations on a Case of Familial Periodic Paralysis, *Clin. Sc.* 3:47, 1937. Gammon, G. D.; Austin, J. H.; Blithe, M. D., and Reid, C. G.: The Relation of Potassium to Periodic Family Paralysis: II. Experimental Data, *Am. J. M. Sc.* 197:326, 1939. Ferrebee, J. W.; Gerity, M. K.; Atchley, D. W., and Loeb, R. F.: Behavior of Electrolytes in Familial Periodic Paralysis, *Arch. Neurol. & Psychiat.* 44:830 (Oct.) 1940.

2. Wilkins, Lawson, and Kramer, Benjamin: Studies on the Potassium Content of Human Serum, *Arch. Int. Med.* 31:916 (June) 1923. Hoff, H. E.; Smith, P. K., and Winkler, A. W.: Cause of Death in Experimental Anuria, *J. Clin. Investigation* 20:607, 1941. Stewart, H. J., and Smith, J. H.: Changes in the Electrocardiogram and in the Cardiac Rhythm During the Therapeutic Use of Potassium Salts, *Am. J. M. Sc.* 201:177, 1941. Keith, King and Osterberg,³ Thomson (footnotes 6 and 7). Finch and Marchand,⁴ Marchand and Finch.⁵

Dr. P. D. White gave helpful suggestions in the preparation of this paper. From the Neurological and Medical Departments of the Massachusetts General Hospital and the Departments of Neurology, Medicine and Pharmacology of the Harvard Medical School. In part under the auspices of the University Committee on Pharmacotherapy.

During a course of six months in the hospital there was little change in his condition in spite of such therapeutic measures as tonsillectomy, a short course of both sulfapyridine and sulfanilamide, plasma transfusions, sodium citrate, ammonium chloride and urea by mouth. The carbon dioxide combining power varied from 18 to 21 milliequivalents per liter. The patient was discharged Aug. 5, 1941, taking 6 to 8 Gm. of ammonium chloride and 5 Gm. of urea each day.

Less than one month later (September 2) the patient was readmitted because of an ascending paralysis of the extremities. There was no history of an upper respiratory infection or fever. Two days before returning he noted some stiffness of his legs when awaking in the morning, and when attempting to walk his legs were weak and soon gave way. This paralysis progressed to involve the trunk muscles and upper extremities. Examination at this time revealed a flaccid paralysis of the extremities, and he was unable to raise his head. The cranial nerves were normal to examination, there was no loss of sensory perception, the deep tendon reflexes were hypoactive, and the abdominal and cremasteric reflexes were absent. There was no difficulty in swallowing or respiration.

Examination of the heart revealed an irregular heart action which was interpreted as due to multiple extrasystoles, but an electrocardiogram revealed partial auriculoventricular block with frequent dropped beats, the characteristic Wenckebach

strength and was discharged on Sept. 11, 1941, taking 6 Gm. of ammonium chloride and 4 Gm. of urea. One week later the blood chloride was 116 milliequivalents per liter and the carbon dioxide combining power was 17.9 milliequivalents per liter. He was again seen on October 11, having lost 6 pounds (2.7 Kg.) but feeling less strong during the preceding few days. Because of this weakness, potassium chloride 3 Gm. daily was added to the regimen. The acidosis continued at about the same level, and edema fluid was retained if the ammonium chloride was omitted for any length of time. He was followed periodically in the outpatient department and when last seen (January 1943) had developed an increased degree of renal failure with azotemia. The blood pressure was 205 mm. of mercury systolic and 130 mm. diastolic, and the hemoglobin was 6 Gm. per hundred cubic centimeters. The blood studies revealed nonprotein nitrogen 60 mg. per hundred cubic centimeters, chloride 108 milliequivalents per liter, carbon dioxide 10.9 milliequivalents per liter, total protein 4.6 Gm. per hundred cubic centimeters, calcium 7.8 mg. per hundred cubic centimeters, phosphorus 10.8 mg. per hundred cubic centimeters and cholesterol 183 milliequivalents per liter. He had not suffered any recurrence of his paralysis but was troubled by much nausea and vomiting. The patient subsequently died in uremia on April 6, 1943 at the Boston City Hospital, where an autopsy was performed and revealed a chronic glomerulonephritis associated with interstitial fibrosis.

This case illustrates the development of transient flaccid paralysis in a patient with renal damage. Although the serum potassium was not determined, the response to potassium chloride with the resulting rapid subsidence of the paralysis quite like that in cases of familial periodic paralysis is sufficient evidence to justify the deduction that a disturbance of body potassium was the cause of the paralysis. The transient electrocardiographic changes associated with the attack contribute evidence of a disturbed body electrolyte balance. The changes seen, particularly the low T waves and impaired auriculoventricular conduction, are those which are also seen in patients who have a low serum potassium from other causes. The return of the electrocardiogram to normal after the administration of potassium chloride by mouth was striking. Potassium chloride was employed thereafter as an adjunct to the diuretic regimen of ammonium chloride and urea to prevent further paralysis. It should be remembered, however, that in patients with pronounced renal insufficiency, particularly when there is a decrease in urinary output or complete anuria, the kidney has difficulty in disposing of potassium and that potassium poisoning may be produced by the administration of potassium salts in abundant quantities. This may occur spontaneously³ and may reach a degree of intoxication sufficient to cause cardiac arrest.⁴

CASE 2.—E. K., a woman aged 34, single, a school teacher, was admitted to the neurologic service of the hospital in July 1941 for attacks of intermittent weakness and stiffness of her legs of fifteen months' duration. The attacks lasted from two to fourteen days. Altogether there were seven episodes, four of which occurred during the month before entry. Six of these were accompanied by stiffness of the neck on motion and some nausea and occasionally vomiting. On one occasion there was flaccid quadriplegia without spasticity.

At the time of admission physical examination revealed that the patient was suffering moderate pain and stiffness of the legs, particularly on the right. The blood pressure was 75 mm. of mercury systolic and 50 mm. diastolic. Examination of the heart gave otherwise normal results. The deep tendon reflexes were present but diminished. The remainder of the

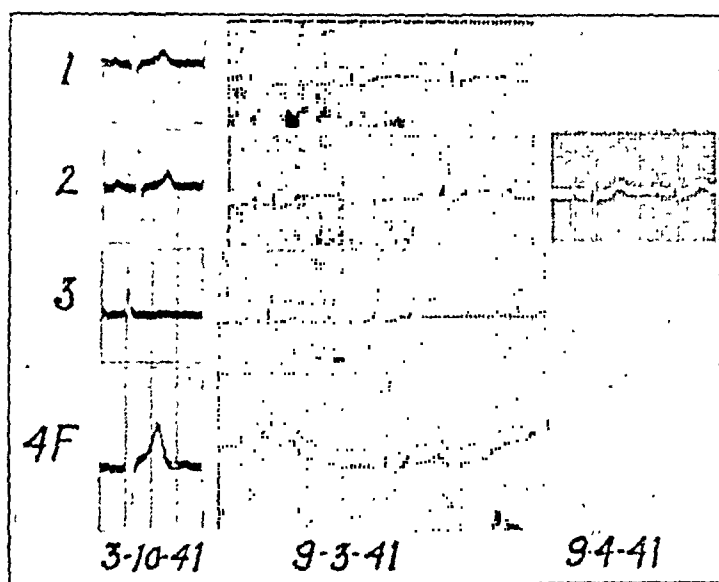


Fig. 1 (case 1).—The first tracing was taken when there was no muscular weakness and is within the limits of normal. The tracing taken Sept. 3, 1941 demonstrates low T waves and a disturbance in auriculoventricular conduction resulting in partial auriculoventricular block and the characteristic Wenckebach phenomenon. There is also depression of the RST segments in all leads. By the following day the rhythm, auriculoventricular conduction and T waves, at least in lead 2, had returned to normal.

phenomenon. The ST segments were depressed in all leads, and the T waves were low in amplitude (fig. 1). The edema of the extremities was unchanged. The spinal fluid was found to be normal, and blood chemistry revealed nonprotein nitrogen 33 mg. per hundred cubic centimeters, carbon dioxide 21.6 milliequivalents per liter and chloride 114 milliequivalents per liter. The urine and blood examinations were unchanged. Neostigmine (prosgimine) 1.5 mg. was given without benefit to the paralysis. Because it was feared that the intercostal muscles might become involved the patient was placed in the respirator.

The diagnosis of familial periodic paralysis was considered and the patient was therefore started on 2 Gm. of potassium chloride every four hours. The following day, after having received 8 Gm. of potassium chloride, he had an electrocardiogram in which the auriculoventricular conduction, the ST segments and the T waves had returned to normal (fig. 1). By this time the improvement in muscular strength was remarkable, and later the same day he was able to sit up in bed and move his extremities around freely. Improvement in muscular strength (first in the arms) was noted after the second dose, and by September 6 he had regained normal

3. Keith, N. M.; King, H. E., and Osterberg, A. E.: Serum Concentration and Renal Clearance of Potassium in Severe Renal Insufficiency in Man, *Arch. Int. Med.* 71: 675 (May) 1943.
4. Finch, C. A., and Marchand, J. F.: Cardiac Arrest by Action of Potassium, *Am. J. M. Sc.* 206: 507, 1943.

physical examination was not remarkable. The blood studies revealed a hemoglobin of 10 Gm. per hundred cubic centimeters, a red blood cell count of 4.1 million, and a white blood cell count of 9,900. An occasional macrocyte was observed in the blood smear. A gastric analysis revealed 3 units of free hydrochloric acid after subcutaneous histamine. The urine examination demonstrated a pH of 6, a 2 plus albuminuria and a fixed specific gravity of from 1.008 to 1.012, even after subcutaneous posterior pituitary injection. An excretory urogram failed to outline the kidney pelves. The nonprotein nitrogen was 32 mg. per hundred cubic centimeters, chloride 107 milliequivalents per liter, carbon dioxide combining power 18.6 milliequivalents per liter, calcium 8.9 mg. per hundred cubic centimeters and phosphorus 3.9 mg. per hundred cubic centimeters. The phenolsulfonphthalein urinary excretion test was less than 15 per cent excretion in two hours.

The patient's symptoms subsided after one to two days in the hospital. At the time of the first admission a diagnosis of hysteria was made, and various other diagnoses were considered, such as pernicious anemia with spinal cord changes, rheumatoid arthritis, multiple sclerosis, myasthenia gravis, Addison's disease and familial periodic paralysis. The patient was transferred to the medical service when it became apparent that her symptoms were secondary to chronic renal disease with acidosis. She was discharged after six weeks, taking amphetamine sulfate 15 mg. twice daily. An electrocardiogram three weeks after subsidence of the symptoms was normal.

In January 1942 the patient was seen in the emergency ward complaining of stiffness of the muscles of the arms and legs and of the jaw muscles, making speech difficult. The attack began a few hours before entry. At the time of the physical examination there was difficulty with speech because of spasm of the jaw muscles. The lower extremities also were spastic. The heart was normal, and the rhythm was regular. The blood pressure was not taken. The nonprotein nitrogen of the blood was 52 mg. per hundred cubic centimeters. Within twenty-four hours the symptoms had subsided, and the patient returned to work.

In March 1942 there was a third admission to the emergency ward with similar complaints. Sixteen Gm of potassium chloride was given during the first day, and it was the patient's impression that the muscular weakness and stiffness disappeared more rapidly than usual. Chemical examination of the blood on this visit revealed nonprotein nitrogen 56 mg. per hundred cubic centimeters, carbon dioxide combining power 16.1 milliequivalents per liter, chlorides 103 milliequivalents per liter, and plasma protein 6.2 Gm per hundred cubic centimeters.

In June 1942 she was again seen in the emergency ward complaining of weakness and fatigue, attributed to hot weather. There was no stiffness or paralysis of her extremities, and no attacks had occurred since March 1942. The physical examination was not remarkable at this time, except for hypoactivity of the reflexes of the extremities and a blood pressure of 90/54. Chemical examination of the blood revealed nonprotein nitrogen 82 mg. per hundred cubic centimeters, carbon dioxide combining power 15.8 milliequivalents per liter, chlorides 100.4 milliequivalents per liter, total base 147 milliequivalents per liter and sodium 119 milliequivalents per liter.

In July 1942, one month later, she spent a week in the hospital for study. The physical examination was not remarkable except for a blood pressure of 80/55. The urine examination remained the same with a fixed specific gravity of 1.010, 2 plus albuminuria and occasional white blood cells. The blood hemoglobin was 10 Gm. per hundred cubic centimeters and the red blood cell count 3.3 million. The urine culture was negative. Chemical examination of the blood revealed nonprotein nitrogen 34 mg. per hundred cubic centimeters, chloride 104.6 milliequivalents per liter, carbon dioxide content 19.3 milliequivalents per liter, protein 4 Gm. per hundred cubic centimeters, phosphorus 5.6 mg. per hundred cubic centimeters, calcium 8.2 mg. per hundred cubic centimeters, phosphatase 7 units and sodium 139 milliequivalents per liter. The 17 ketosteroid excretion amounted to 5.3 mg. in twenty-four hours. The phenolsulfonphthalein excretion was 10 per cent in two hours.

All medication was then discontinued, and the patient did well and was able to return to teaching school. In November 1942 she was seen in the outpatient department and was advised to take 2 cc. of sodium citrate, three halibut liver oil capsules and two glasses of milk each day, because of a few cramps in the legs during the week previous to her visit. She continued this for a few weeks but stopped taking them when her supply became exhausted. Her health continued good, however, and she continued to teach school.

On Jan. 20, 1943 there was an attack of an entirely different nature. This was characterized by the gradual onset of generalized weakness, culminating in a complete collapse on the floor of the schoolroom during class. The paralysis was limited to the extremities. The patient was helped home and brought to the hospital on the following day, unable to raise herself in bed and scarcely able to move her hands. The physical examination was not remarkable except for the profound weakness of the extremities and total inability to move the legs or feet. The deep tendon reflexes were present and equal. The heart rhythm was regular, and the blood pressure was 80/50. The urine examination was the same as previously. Chemical examination of the blood revealed nonprotein nitrogen 62 mg. per hundred cubic centimeters, carbon dioxide combining power 10.7 milliequivalents per liter, chloride 105 milliequivalents per liter, protein 6.9 Gm. per hundred cubic centimeters, phosphorus 7.8 mg. per hundred cubic centimeters, calcium 8.7 mg. per hundred cubic centimeters. The electrocardiogram taken the same day, together with subsequent tracings, is illustrated in figure 2. These records revealed some depression of the ST segments in all leads with low to isoelectric T waves, which had disappeared four days later. No potassium chloride was given during this time, but the serum potassium after return to normal muscle function was 4.5 milliequivalents per liter.

The patient did well and returned to work but came back on March 13, 1943 complaining of cramps in the muscles of the extremities. At this time chemical examination of the blood revealed nonprotein nitrogen 64 mg. per hundred cubic centimeters, carbon dioxide combining power 26.8 milliequivalents per liter, chloride 84.9 milliequivalents per liter, calcium 9.4 mg. per hundred cubic centimeters and phosphorus 1.8 mg. per hundred cubic centimeters. There was no definite relief with calcium gluconate intravenously. It was considered at this time that the muscular cramps were due to the low chloride rather than to lack of calcium. Following recovery the patient returned to the hospital two months later with similar cramps and with blood chemistry findings of serum potassium 2 milliequivalents per liter, nonprotein nitrogen 54 mg. per hundred cubic centimeters, carbon dioxide combining power 17.7 milliequivalents per liter, chloride 97.4 milliequivalents per liter, calcium 7.2 mg. per hundred cubic centimeters, phosphorus 1.8 mg. per hundred cubic centimeters and phosphatase 2.8 mg. per hundred cubic centimeters. The plasma chloride was normal, but the acidosis had returned and the calcium was again low. The intravenous pyelogram revealed evidence of small kidneys with pronounced impairment of their

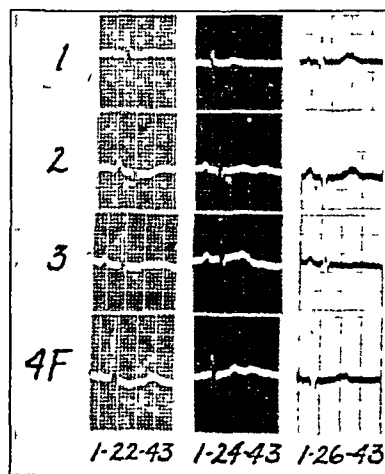


Fig. 2. (case 2).—The first tracing was taken when the patient had profound paresis of the voluntary muscles, particularly of the lower extremities. The low to isoelectric T waves and slight depression of the ST segments should be noted, which become normal by Jan. 26, 1943, at which time muscular strength was normal. The PR interval remains unchanged. The prominence of the U wave in lead 4-F on January 22 and 24 is of interest, but the explanation of this remains obscure. An electrocardiogram taken on January 25 during an episode of carpopedal spasm revealed a QT interval of 0.44 second with a calculated normal for the heart rate of 0.38 second.

ability to concentrate diodrast. The patient has continued to do well on a regimen of 1 to 2 pints of milk, sodium citrate 6 Gm. and 50 thousand units of vitamin D daily. There was no subsequent recurrence of muscular paralysis. In June 1943 the blood calcium was 10 mg. per hundred cubic centimeters and the phosphorus was 4 mg. per hundred cubic centimeters.

This case was of interest from both the medical and the neurologic point of view. There seems little doubt that the episode of flaccid muscular paralysis was associated with an imbalance of body potassium. The low serum potassium and the abnormal electrocardiograms during the paralysis are the evidence for this interpretation. On the other hand, the cramps and carpopedal spasm at numerous times were associated with a low serum calcium and were relieved frequently by parenteral calcium therapy. However, the muscular cramps on one occasion were associated with a normal blood calcium and a low plasma chloride, suggesting that on this occasion the low chloride was the cause of the muscular cramps. The evidence of serious renal damage was clearcut and indicated tubular, as well as

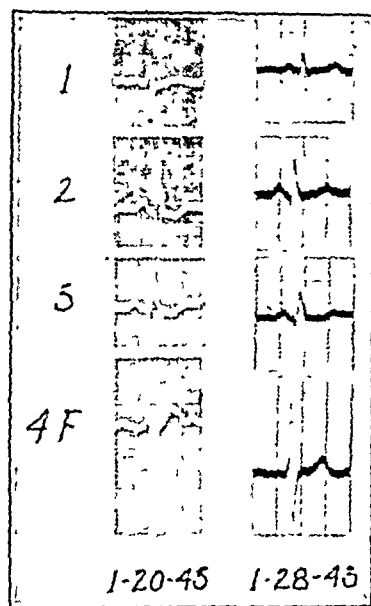


Fig. 3 (J. T. S.).—This patient has been the subject of reports twice previously in the literature (1898 and 1915) and on his last visit to this hospital developed a typical attack of paralysis the day following a herniorrhaphy. The electrocardiogram taken on Jan. 20, 1943 was while he was paralyzed and was repeated on January 28, at the time of complete recovery. He received potassium chloride with moderately prompt relief from his paralysis. The similarity of these electrocardiograms to those of the 2 cases reported is quite evident. The low T waves, the slight depression of the ST segments and the U wave in lead 4 should be noted. There is a slight impairment of intraventricular conduction in both tracings (QRS = 0.11 to 0.12), which is very likely due to coronary heart disease.

be harmful in the presence of renal insufficiency. Since that time further observations have indicated that the diseased kidney may have difficulty in excreting potassium and that potassium sometimes accumulates in excessive quantities in the blood and tissue fluid. In the 2 patients presented here there was no evidence of serious renal insufficiency in regard to nitrogen retention. The depletion of the base, particularly of sodium and potassium, may be explained by a failure

glomerular damage. The tubular damage seemed to predominate in this patient, since the electrolyte disturbance overshadowed the mild, intermittent nitrogen retention. The value of the electrocardiogram as an aid at times in estimating the status of potassium balance is noteworthy. It should be observed that this patient did not receive potassium chloride during the period of recovery of muscular strength, as did patient 1 and that the electrocardiogram did not return to normal as rapidly as in the first case. The hypotension is explained by sodium loss and dehydration.

COMMENT

Interest in the difficulty of potassium excretion by the kidneys in chronic nephritis dates from Smillie's⁵ observation that the administration of potassium may

of the diseased kidney to form ammonia in association with the excretion of acid radicals. The effect of such a failure may have been aggravated in case 1 by the extra chloride given as ammonium chloride.

In recent years there have been several reports concerning the effect of elevated serum potassium on the electrocardiogram. It has been noted that in renal insufficiency with retention of potassium the T waves increase in amplitude. With more advanced stages of intoxication there is impairment of intraventricular conduction and finally cardiac arrest.⁶ These changes had been noted previously in animals during experimental renal insufficiency, and the toxic effect of the excessive potassium on the heart was the cause of death. It has been noted that in adrenal insufficiency the occasional accumulation of potassium may affect the electrocardiogram.⁷ Conversely, in overactivity of the adrenal cortex the potassium may be unusually low⁸ and the electrocardiogram may reveal low or isoelectric T waves.⁹

The effect of excessive desoxycorticosterone acetate treatment in Addison's disease results in loss of body potassium and may account for the electrocardiographic changes observed in patients who have developed congestive heart failure as a result thereof.¹⁰ In familial periodic paralysis definite electrocardiographic abnormalities have been observed, and these include lowering of the T waves and an increase in the auriculoventricular conduction.¹¹ In figure 3 are illustrated the electrocardiograms taken during and after paralysis of a patient with characteristic familial periodic paralysis, originally reported from this hospital by Taylor in 1898¹² and again by Edsall and Means¹³ in 1915. It is of interest that the patient reported in 1915 had found potassium salts of benefit in restoring muscular strength during an attack of paralysis.

In both instances of renal failure presented here the T waves in the electrocardiogram were low and returned to normal with the subsidence of the paralysis. The auriculoventricular conduction in the first case was prolonged, giving rise to the Wenckebach periods and intermittent dropped beats. These changes in the electrocardiogram, namely decreased amplitude of the T waves, depression of the ST segments and partial auriculoventricular block, are to be compared with the toxic effects of digitalis on the electrocardiogram. It is of interest, in this regard, that a decrease of potassium in the cardiac muscle has been observed by several authors to result from giving toxic doses

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of digitalis.¹⁴ Potassium salts have also been reported to dispel ventricular premature systoles which are produced by toxic doses of digitalis.¹⁵

SUMMARY

In 2 patients there was an association of chronic nephritis and episodes of flaccid paralysis of the extremities. In the first patient the degree of the acidosis was aggravated by the administration of ammonium chloride. The attacks of paralysis resembled episodes of familial periodic paralysis. The abnormal electrocardiogram in each case was similar to the electrocardiogram observed in periodic paralysis and in serum potassium depletion from other causes. Serial electrocardiograms were of value in demonstrating the nature of the paralytic attacks. The oral administration of potassium chloride was apparently of benefit in overcoming the muscular paralysis.

A third patient admitted to the neurologic service of the Massachusetts General Hospital has recently been diagnosed as having muscular paralysis due to low serum potassium and renal disease. This patient was admitted first on Oct. 15 and discharged on Oct. 26, 1943. He was a Portuguese garage mechanic aged 40, married, who first noted weakness of the left leg and soreness of the neck and back on October 13. The next day the arms and legs were paralyzed and he could walk only with aid.

The past history showed that he had passed two small stones and had complained of hematuria at the age of 38.

At the time of admission the neurologic examination was negative except for the weakness of the arms, legs, neck and trunk. The urine showed a 2 plus albumin, many white blood cells and an occasional red blood cell, and a specific gravity of 1.004. The lumbar puncture and the Hinton test were negative. The weakness disappeared, and he was discharged with the diagnosis of radiculomyelitis.

The patient was admitted a second time on Nov. 11 and discharged on Dec. 8, 1943. He had had a return of the weakness two days before and had passed some gravel in the urine four days before admission. There was sudden improvement the day of admission and, when first seen, he could sit up and stand.

The neurologic examination and lumbar puncture were again negative. Urine examinations were the same as those of the previous admission. The serum calcium was 9.1 mg. per hundred cubic centimeters, chloride 107 milliequivalents per liter and nonprotein nitrogen 24 mg. per hundred cubic centimeters. The potassium on November 27 was 2.5 milliequivalents per liter and on December 2 it was 2.9 milliequivalents per liter. The urine concentration test never exceeded a specific gravity of 1.012. Phenolsulfonphthalein urinary excretion test showed 82 per cent. X-ray examination of the abdomen showed a kidney stone on the left and possibly on the right. Retrograde and intravenous pyelograms showed stones in both kidneys. The electrocardiogram showed a normal tracing on November 24 with the exception of a low upright T wave, characteristic of low serum potassium. The diagnosis was kidney stones accompanied by a lesion of the renal tubules without glomerular involvement and low serum potassium.

The patient improved on sodium citrate, potassium citrate and calcium gluconate. He was discharged on this medication with instructions to test the pH of the urine daily.

264 Beacon Street.

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INFLUENCE OF CONTINUOUS CAUDAL ANALGESIA AND ANESTHESIA

ON THE BLOOD LOSS DURING THE THIRD STAGE OF LABOR

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From the dawn of medical history to the present day the handling of the third stage of labor has been an esoteric problem attested by the voluminous literature and the manifold methods that have been devised for the most beneficent results. A few of these stratagems will serve to refresh the memory and generate smiles of sympathy in compliment to the infinite ingenuity of our forebears. Methods¹ adhered to by the ancients consisted in pulling on the umbilical cord, pressing on the belly, giving emetics, tickling the nose to provoke sneezing, encouraging the woman to blow hard into a gourd, bottle or closed fist, and removing the placenta by hand from the uterus or vagina. Then came the idea of moderate cord traction plus fundal pressure; in 1767 John Harvie of the Rotunda Hospital, Dublin, Ireland, proffered a scheme in which he advised guarding the uterus for fifteen to thirty minutes and then exerting fundal pressure, resulting in delivery of the afterbirth. The Dublin method was promoted in 1783; in 1799 Osiander talked of "expression" of the placenta, and in 1820 he resolved on a method of expression of the secundines resembling the later Credé method but adding traction on the cord. Credé of Leipzig first advocated his time revered method in 1853; this and the modified Credé method designated as "expression of the placenta" from the vagina and first recommended by Williams is still in wide practice today. Subsequently Altfeld postulated his "hands off the uterus" doctrine. Baudelocque² in 1789 was the first to distinguish the separation from the expulsion of the placenta and described the two ways in which the placenta could be extruded from the uterus. In 1865 Schultze decided that expulsion usually took place the first way Baudelocque had described. This remained undisputed until 1871, when Duncan contended that the second method was the more frequent. Thereafter the methods were designated by the names Schultze and Duncan respectively. De Lee's plan was based on the Dublin method. Mojon and Gabaston determined a procedure of injecting a solution into the umbilical vein to increase the volume and weight of the placenta and hasten its detachment, especially if the placenta was thin and widespread in its attachment. Fuchs advised lifting the uterus out of the pelvis as a means of aiding separation of the membranes from the uterine cavity. Greenhill employs the method advocated by Brandt and reiterated by Andrews. Brandt³ uses the Dickinson-Pomeroy method, discussed thor-

1. De Lee, J. B.: Principles and Practice of Obstetrics, ed. 7, Philadelphia, W. B. Saunders Company, 1938.

2. Stander, H. J.: Williams Obstetrics, ed. 7, New York, D. Appleton-Century Company, Inc., 1936.

3. Brandt, M. L.: Am. J. Obst. & Gynec. 25: 662, 1933.

oughly by Smith, of lifting the uterus out of the pelvis as a test for placental separation, keeping the uterus high and at the same time making simple suprapubic pressure to expel the afterbirth.

Today, the problem of placental expulsion still exists, though it is now superseded in part by its accompanying problem of blood loss. Even as food is the potential potent weapon of war, so is blood the potential potent weapon against the onset of disease; every drop saved is a weapon gained to combat possible morbidity and mortality. "The blood is the Life" (Exodus 12:1). The obstetric corollary of this Biblical statement is, as De Lee⁴ pointed out, "save blood." One of the most pertinent functions of the accoucheur is to conserve a woman's blood. This is vigorously borne out by the startling statement that "more women die from accidents of the third stage of labor than during the other two combined."

Strictly speaking, the duration of the third stage of labor is from the birth of the child to the birth of the placenta in toto. Some men have extended this period to include the time needed for complete involution of the uterus; but, from a practical point of view, the third stage of labor should include at least the first hour post partum. It is in this period following delivery of the baby and in the first hour following delivery of the placenta that intrauterine bleeding occurs as a result of poor uterine muscle tone and that the aptly termed "accidents of the third stage" occur. As Calkins⁵ expresses it, "constant attention to constant uterine contraction means controlled blood loss."

The conviction or belief that there is a physiologic blood loss in the third stage of labor developed through an attempt to rationalize away the apparent 200 to 400 cc. volume of bleeding that occurred not infrequently in the so-called noninfluenced spontaneous deliveries. It is of universal opinion and observation that the patient's recovery is accelerated in proportion to the blood loss; the smaller the quantity of blood lost at the time of delivery, the quicker the patient will recuperate and lactate, and the greater are the chances of recovery without infection. Hence, in the last few years new technics for the control of bleeding in the third stage of labor have been developed. The ancients were concerned primarily with extracting the afterbirth; now we are concerned with expeditious delivery of the placenta in conjunction with minimal blood loss and without injury to the uterus. The uses and abuses⁶ of posterior pituitary injection and of ergonovine hydrochloride and their combinations and variations, their administration intramuscularly or intravenously or both, their most propitious times for injection, have filled the literature. Again this attests that controlled blood loss in the third stage of labor is considered today of momentous import.

The mechanism of the third stage of a normal labor is well described by Brandt.³ He states that "as the child is expelled . . . the size of the uterus diminishes partly as a result of muscular tone and partly due to uterine muscle contraction. As a result of this change . . . there is developed a layer of over-distended veins in the decidua spongiosa lying between a firmly contracted uterine wall and a more or less

solidly compressed placenta. . . . the congested venous sinuses burst and the extravasated blood under tension causes tearing of the very fine septa of the spongiosa, thereby detaching the placenta from its uterine site. For this normal mechanism to occur . . . contracted uterine wall and compressed compact placenta must be present. If either of these is absent, separation does not follow a normal course. . . . as the separated placenta is detached from its uterine site, it folds on itself but is held in the uterine cavity because of the firm attachment of the membranes. If the uterine contraction that has separated the placenta is strong, the placenta may be expelled into the lower uterine segment and upper vagina, the placenta acting as a foreign body. . . . when this occurs, the retroplacental hematoma does not form and can have no function. If, however, after placental detachment, with the membranes still firmly adherent, the separating pain is not strong enough to force the placenta out of the uterine cavity, bleeding both from the intervillous spaces of the placenta and from the maternal sinuses takes place during the following uterine relaxation. The subsequent uterine contraction acting on the increased bulk as on a hydraulic wedge forces the placenta down into the lower segment, peeling the membranes off the uterine wall at the same time. Manipulation of the uterus at this time may detach the membranes at one point so that the retroplacental blood escapes without completely detaching the membranes at the placental border, resulting in retention of the placenta with increased bleeding."

The mechanism of the third stage of labor would normally take place in a patient who has undergone no outside influence such as barbiturates, morphine, scopolamine, inhalation anesthesia or undue abdominal uterine manipulation. However, it is against the modern day conception of obstetrics to permit a woman to enter and proceed in travail without aid directed particularly to her relief of that pain which, in the eyes of man, is the most agonizing and harrowing experience of parturition. Nature makes an attempt to follow a natural course but, with this outward interference, the picture is altered in that uterine muscle tone is inhibited and uterine muscle contractility is delayed, preventing rapid separation and extrusion of the placenta; as a result, the amount of blood lost has come to be looked on as natural or physiologic.

The constant endeavor to eliminate pain and minimize blood loss heretofore has been realized to some extent. Now, with the adaptation of continuous caudal analgesia and anesthesia, the tearing pains of childbirth are alleviated from early in the first stage; no deleterious effect on the progress or termination of labor is produced; the volume of blood lost at the time of placental deliverance is definitely decreased. Eliot Bishop⁷ says that "proper analgesia and good obstetrics will, as the late Ralph Pomeroy said, 'convert an unterrified and undamaged primipara into a competent multipara.'"

During the past year and a half we have had many opportunities to observe the striking results of the procedure and technic which has been so well established. It has been our good fortune at the Philadelphia Lying-In Hospital to be closely associated in this work with Drs. Hingson and Edwards of the United States Public Health Service, the originators of this method.

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Attention is called to the many benefits of this method as well as to some of the contraindications to its administration. Most of the contraindications have been elaborated on by the originators⁸ and by other observers, such as Lull,⁹ Gready and Hesseltine,¹⁰ Adams, Lundy and Seldon,¹¹ Irving, Lippincott and Meyer,¹² Block and Rochberg,¹³ Siever and Mousel¹⁴ and others.

Many of the important points are lost by critics who condemn the method and the associated marvelous results because of their lack of experience and knowledge of the technic. They lose sight of the important factors during and following the relief of the pains of labor. In their overzealous enthusiasm they frequently offer destructive rather than constructive criticism, and their lack of experience and ignorance of the fundamentals of anatomy, physiology and pharmacology is the basis of their criticism. As this method of relief of pain in childbirth is founded on sound and safe principles, if the technic is fulfilled correctly, definite and striking results can be expected.

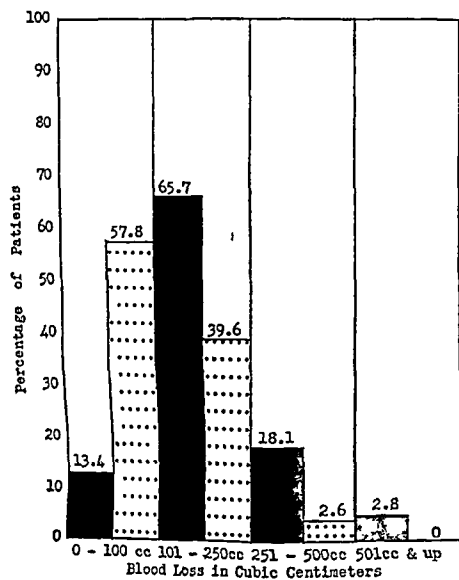


Chart 1—Composite of tables 1 and 2. Solid columns, blood loss under inhalation anesthesia; stippled columns, blood loss under continuous caudal anesthesia. Of patients delivered under continuous caudal anesthesia 97.4 per cent fall into blood loss group 0-250 cc. Of patients delivered under inhalation anesthesia 79.1 per cent fall into blood loss group 0-250 cc.

One of the outstanding benefits to a patient who is delivered under caudal analgesia is the prompt termination of the third stage of labor and the amazingly small amount of blood lost. The placental separation is surprisingly prompt, and the abrupt separation and expulsion is accompanied by even less than moderate blood loss. It has been our observation that much separating hemorrhage is not the rule. The system employed for collecting blood is as follows. A sterile basin is held against the perineum during the period

of active bleeding; routine measurement of the blood is done. This estimation includes all fluids from the vaginal canal after termination of the second stage of labor until completion of the episiotomy repair. Additional and uncollected blood during the third stage and during the first hour post partum is estimated and

TABLE 1—Third Stage of Labor Conducted Under Inhalation Anesthesia

Blood Loss, Cc	Number of Cases	Blood Loss, Cc
0 - 50	15	377
50 - 100	119	8,925
101 - 200	501	78,625
201 - 250	156	35,100
251 - 300	109	29,975
301 - 350	30	9,750
351 - 400	27	9,125
401 - 500	10	6,750
501 and above	28	14,000
	1,000	102,625
Average blood loss per patient = 102.6 cc		
0 - 100 cc blood loss experienced by 13.4%		
101 - 250 cc blood loss experienced by 65.7%		
251 - 500 cc blood loss experienced by 18.1%		
501 cc & up blood loss experienced by 2.8%		
0 - 250 cc group = 79.1%		

added to make the total loss. (The patients are kept in the delivery room for one hour post partum under constant surveillance. It has been noted that the amount of blood lost during this interval, as indicated by the number of clots expressed and blood appearing on the vulvar pads, is clearly diminished.) No accurate hemoglobin estimations of the blood collected and of the maternal blood are done. This, we have always believed, is the only reliable way of accurately measuring blood loss. The values we have obtained are subject to criticism, but, at least, the method does show the decreased incidence in abnormal blood loss with reasonable accuracy, and it has impressed on us, in case after case, the repeatedly low blood loss. Pastore's¹⁵ statement that there is a tendency to underestimate losses above 450 cc and to overestimate losses

TABLE 2—Third Stage of Labor Conducted Under Continuous Caudal Analgesia and Anesthesia

Blood Loss, Cc	Number of Cases	Blood Loss, Cc
0 - 50	176	4,400
51 - 100	402	30,150
101 - 200	309	45,000
201 - 250	96	21,600
251 - 300	6	1,800
301 - 350	8	2,800
351 - 400	10	4,000
401 - 500	2	1,000
501 and up	0	0
	1,000	110,750
Average blood loss per patient = 110.75 cc		
0 - 100 cc blood loss experienced by 57.8%		
101 - 250 cc blood loss experienced by 39.6%		
251 - 500 cc blood loss experienced by 2.6%		
No patient lost more than 501 cc of blood		
0 - 250 cc group = 97.4%		

below 150 cc. tends to be fairly accurate, and we have tried to avoid such error.

It is difficult or unfair to expect a strict comparison between our data and the data collected from the literature, as no one technic for estimation of blood loss was used. However, we believe that a comparison is still worth while if it is made with the figures given by competent observers.

8 Hingson, R. A., and Edwards, W. B. Continuous Caudal Analgesia, J. A. M. A. 123: 538 (Oct. 30) 1943.
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12 Irving, F. R., Lippincott, A., and Meyer, F. C. New York State J. Med. 43: 1025, 1943.
13 Block, N., and Rochberg, S. Am. J. Obst. & Gynec. 45: 645, 1943.
14 Siever, J. M., and Mousel, L. H. Continuous Caudal Anesthesia in Three Hundred Unselected Obstetric Cases, J. A. M. A. 122: 424 (June 12) 1943.

The average blood loss in our series of 1,000 obstetric cases of delivery under inhalation anesthesia was 192.62 cc., as shown in table 1; the average blood loss in our series of 1,000 obstetric cases of delivery under continuous caudal analgesia and anesthesia was 110.75 cc., as shown in table 2. These two figures are con-

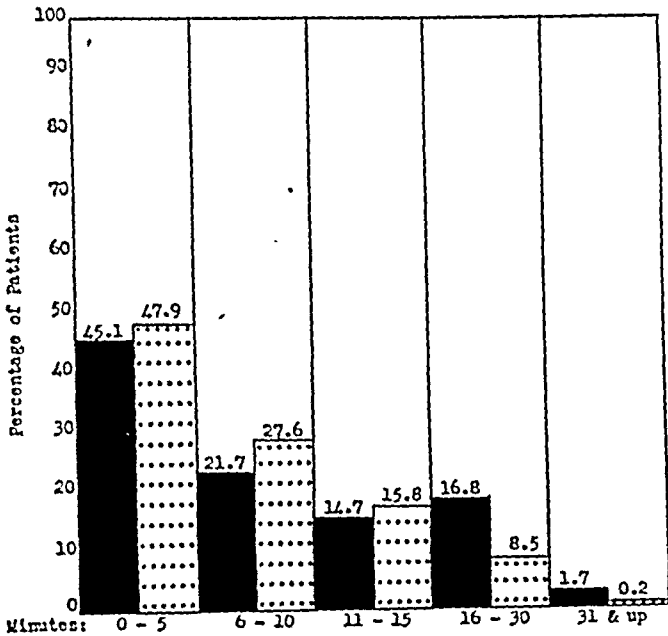


Chart 2.—Data from table 3. Solid columns, patients delivered under inhalation anesthesia; stippled columns, patients delivered under continuous caudal anesthesia. Of patients under continuous caudal anesthesia 91.3 per cent completed the third stage of labor in fifteen minutes or less. Of patients under inhalation anesthesia 81.5 per cent completed the third stage of labor in fifteen minutes or less. Of the patients 9.8 per cent had a third stage of labor longer than fifteen minutes under inhalation than under continuous caudal anesthesia.

trasted with Williams's¹⁶ 343.7 cc. (measured), Alhfeld's¹⁷ 505.1 cc. (measured), De Lee's 500 cc., Tarnier's 600 cc., Pastore's¹⁸ 271.3 cc., Tucker's 300 cc. (measured), Calkins'¹⁹ 222 cc. and 179 cc. (partially measured), Plass's²⁰ 317 cc., Fortin's²¹ 275 cc.,

TABLE 3.—Number of Patients Delivered Under Continuous Caudal and Under Inhalation Anesthesia

Duration of the Third Stage of Labor in Minutes	Number of Patients Delivered Under Inhalation Anesthesia	Number of Patients Delivered Under Continuous Caudal Anesthesia	Percentage	
			Inhalation Anesthesia	Continuous Caudal Anesthesia
0 - 5	451	479	45.1	47.9
6 - 10	217	276	21.7	27.6
11 - 15	147	158	14.7	15.8
16 - 30	168	85	16.8	8.5
31 and above	17	2	1.7	0.2
	1,000	1,000	100.0	100.0

91.3% of patients completed 3d stage of labor under continuous caudal anesthesia in 0-15 min.
81.5% of patients completed 3d stage of labor under inhalation anesthesia in 0-15 min.

Under inhalation anesthesia, twice the number of patients had a 3d stage of labor longer than 15 minutes as compared with those who had continuous caudal analgesia

Ryder's²² 177 cc., Scott's²³ 198.7 cc., Jess's²⁴ 187.8 cc., Leff's²⁵ 171.75 cc., and Brandt's³ 195 cc. These data are presented in table 4. Pastore¹⁵ in 1936

reported 500 consecutive cases in which there were 32 with a blood loss of 600 cc. or more, giving an incidence of 6.4 per cent, and in 1937 he reported¹⁸ 1,870 consecutive cases in which there were 133 with a blood loss of 600 cc. or more, giving an incidence of 7.1 per cent; Williams¹⁶ in 1919 reported an incidence of 13 per cent in his series of 1,000; Polak²⁶ in 1915 reported 1,306 consecutive home deliveries and 694 operative deliveries with only three hemorrhages; Brandt³ in 1933 reported 800 consecutive deliveries with an incidence of 1.25 per cent; Peckham and Kuder²⁷ in 1933 in a study of 19,200 consecutive deliveries at Johns Hopkins Hospital, found an incidence of 6.14 per cent; Calkins⁵ in 1933 reported an incidence of 2.5 per cent in 800 cases; Tucker and Benaron²⁸ in 1938 reported an incidence of 4.2 per cent in 14,156 consecutive deliveries on the home delivery service of the Chicago Maternity Center; Urner²⁹ in 1936 reported an incidence of 3.4 per cent in 7,500 consecutive cases; Fortin²¹ in 1938 reported an inci-

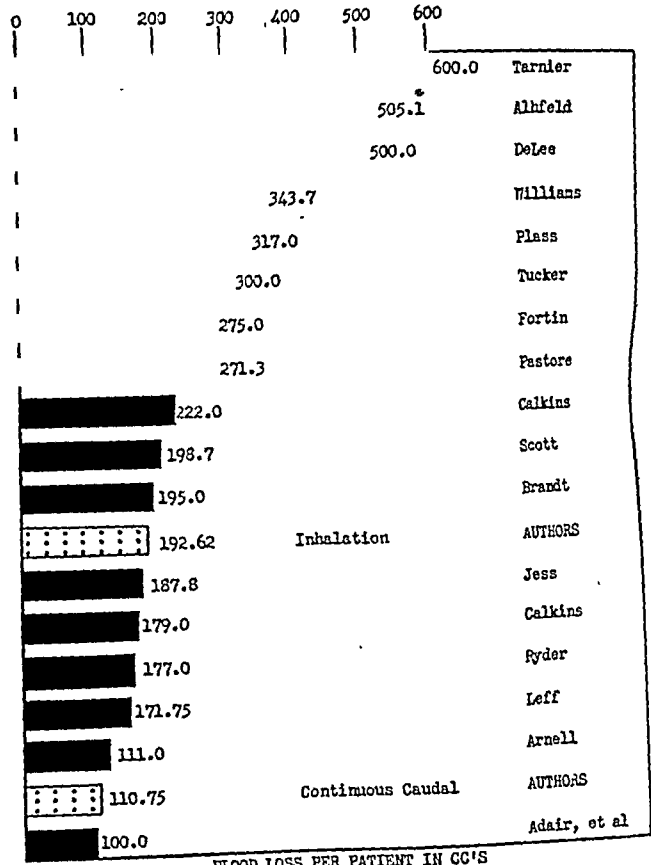


Chart 3.—Data from table 4.

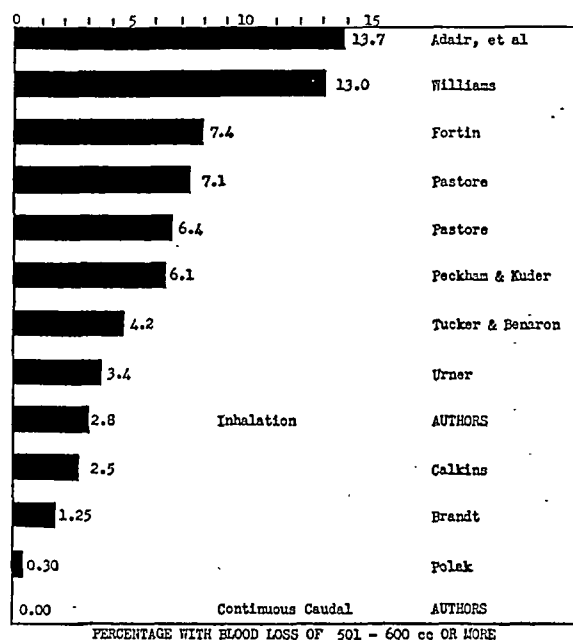
dence of 7.4 per cent in 200 consecutive cases in which barbituric acid derivatives had been given during the first stage of labor. In our group of 1,000 maternity patients delivered under inhalation anesthesia, 28 had a blood loss of 501 cc. or more, giving an incidence of 2.8 per cent; in the 1,000 maternity patients delivered under continuous caudal analgesia and anesthesia there was no instance of a blood loss of 501 cc. or more. These data are shown in table 5. We found that under inhalation anesthesia 79.1 per cent of patients fall into the blood loss group of 0-250 cc. as compared to 97.4 per cent of the patients delivered under continuous caudal analgesia and anesthesia. These figures are shown in chart 1 (tables 1 and 2).

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22. Ryder, G. H.: Am. J. Obst. & Gynec. 2: 61, 1921-1922.
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The use of ergonovine in the early phase of the third stage of labor has materially shortened the duration of the third stage and decreased the volume of blood lost at that time. Adair and his associates³⁰ in 51 patients found an average blood loss of 100 cc., the maximum loss being 300 cc. in 86 per cent of the patients while 13.7 per cent experienced a loss of 500 cc. or over. Reich,³¹ Eastman,³² Diddle³³ and Davis and Boynton³⁴ present data showing that intravenous injection of a therapeutic dose of ergonovine just preceding expulsion of the shoulders in vertex presentations or of the after-coming head in breech presentations is relatively safe and effective in reducing incidence of postpartum hemorrhage due to uterine atony. Roberts³⁵ found that, with the exception of about 1.5 per cent of patients so treated, this procedure did not bring about any appreciable decrease in volume of blood lost in the third stage of labor. Arnell, in discussing Diddle's article,³³ presented data in which blood loss was determined by the chemical colorimetric method. He found that, when ergonovine hydracrylate was given intravenously at the time of impingement of the anterior shoulder of the fetus under the symphysis, blood loss in 500 cases averaged 111 cc. The incidence of "trapped" placenta in the method described is definitely increased. Among the 1,000 patients delivered under inhalation anesthesia at the Philadelphia Lying-In Hospital there were 6 instances in which manual extraction of the secundines was necessary to

minutes as compared with 21.7 per cent given inhalation anesthesia. The third stage of labor was completed in eleven to fifteen minutes by 15.8 per cent who had continuous caudal anesthesia as compared with 14.7 per cent given inhalation anesthesia. Under continuous caudal analgesia and anesthesia about 10 per cent



PERCENTAGE WITH BLOOD LOSS OF 501-600 cc OR MORE

Chart 4.—Data from table 5.

TABLE 4.—Comparison of Blood Losses Reported in the Literature

Author	Blood Loss per Patient, Cc.	Author	Blood Loss per Patient, Cc.
Tardier.....	600.0	Brandt.....	195.0
Althfeld.....	505.1	Authors, inhalation.....	192.62
De Lee.....	500.0	Jess.....	187.8
Williams.....	343.7	Calkins.....	179.0
Plass.....	317.0	Ryder.....	177.0
Tucker.....	300.0	Left.....	171.75
Fortin.....	275.0	Arnell.....	111.0
Pastore.....	271.3	Authors, continuous caudal.....	110.75
Calkins.....	222.0	Adair et al.....	100.0
Scott.....	198.7		

complete the third stage of labor. In our entire 1,000 cases under continuous caudal analgesia and anesthesia there was but one "trapped" placenta, which occurred in the early part of the series when the oxytocic drugs were being administered routinely after the second stage of labor was completed. No evidence of trapping or incarceration has occurred since the oxytocic has been given after completion of the third stage of labor.

The duration of the third stage of labor in itself is incidental, the blood loss being the factor of importance, but in comparing the times for the third stage of labor in patients delivered under inhalation anesthesia with those delivered under continuous caudal analgesia we found that under the latter the time factor too had decreased. The third stage of labor was completed in five minutes or less by 47.9 per cent who had continuous caudal anesthesia as compared with 45.1 per cent given inhalation anesthesia; 27.6 per cent who had continuous caudal analgesia and anesthesia completed the third stage of labor in six to ten

more patients completed the third stage of labor in fifteen minutes or less than under inhalation anesthesia. Twice the number of patients had a third stage of labor longer than fifteen minutes under inhalation anesthesia as compared with those who had continuous caudal analgesia and anesthesia. There were but 2 instances in the group of patients under continuous caudal anesthesia in which completion of the third stage took longer than thirty-one minutes, as compared to

TABLE 5.—Comparison of Incidence of Hemorrhage Reported in Literature and Incidence of Hemorrhage Found at Philadelphia Lying-in Hospital.

Author	Number of Patients	Percentage with Blood Loss of 501-600 Cc. or More
Adair et al.....	51	13.7
Williams.....	1,000	13.0
Fortin.....	200	7.4
Pastore.....	1,870	7.1
Pastore.....	500	6.4
Peckham and Kuder.....	10,200	6.14
Tucker and Benaron.....	14,156	4.2
Urner.....	7,500	3.4
Authors, inhalation.....	1,000	2.8
Calkins.....	800	2.5
Brandt.....	800	1.25
Polak.....	2,000	0.30
Authors, continuous caudal.....	1,000	0.00

17 instances in the group of patients under inhalation anesthesia. These figures are represented in table 3 and chart 2.

We have found that the management of the third stage of labor simplifies itself. Our present procedure is to follow Althfeld's "hands off the uterus" policy until the first firm uterine contraction has occurred following delivery of the infant. The maneuver used at this time is a combination or amalgamation of Brandt's, Pastore's and Calkins' technic. At the time of the first firm uterine contraction, in cases without

30. Adair, F. L.; Davis, M. E.; Kharasch, M. S., and Legault, R. R.: *Am. J. Obst. & Gynec.* 30: 466 and 740, 1935.
31. Reich, A. M.: *Am. J. Obst. & Gynec.* 37: 224, 1939.
32. Eastman, N. J.: *Internat. Clin.* 3: 264, 1939.
33. Diddle, A. W.: *Am. J. Obst. & Gynec.* 43: 450, 1942.
34. Davis, M. E., and Boynton, M. W.: *Am. J. Obst. & Gynec.* 43: 775, 1942.
35. Roberts, P. C.: *Am. J. Obst. & Gynec.* 43: 849, 1942.

bleeding, "the left hand of the assistant is placed flat over the abdomen with the fingers directed under the symphysis. The left hand prevents the fundus from entering the pelvis."³⁶ The placenta is delivered, not at the price of abdominal, uterine or intestinal bruising. Following delivery of the placenta, the uterus is raised and held high out of the pelvis by means of the Dickinson-Pomeroy technic. If bleeding occurs immediately after delivery of the infant, a Credé maneuver is performed and, at the time of the first firm uterine contraction, the aforementioned technic is followed. Should the bleeding persist and the placenta not deliver, a manual removal under aseptic precautions would be done without hesitation. If, after forty-five to sixty minutes have elapsed, the placenta has not separated and is not lying in the lower uterine segment, and if no occult or obvious bleeding has occurred and management as described has failed, manual removal is indicated. Under continuous caudal anesthesia at that late stage, difficulty would be experienced since the cervical os is closed and the operator needs complete relaxation to facilitate cervical dilatation and manual extraction of the secundines. If, on the other hand, manual removal is anticipated and indicated immediately after the second stage, it can be performed ably under caudal anesthesia alone, for the cervical os is still widely patent.

Our previous technic of giving 1 cc. of posterior pituitary injection intramuscularly after the second stage of labor and 1 cc. of a preparation of ergot intramuscularly after completion of the third stage was abandoned. It was found not necessary to use any oxytocic drug until the third stage was completed. Our present technic consists in giving 1 cc. of the preparation of ergot intramuscularly or 1 cc. containing 0.5 cc. of the preparation of ergot and 0.5 cc. of posterior pituitary injection intramuscularly in the outer surface of the thigh, as no sensation is experienced in the introduction—this in preference to the deltoid region, where some pain is usually experienced. It is wise to give the ergot preparation after the delivery of the placenta, for some relaxation might occur following the loss of sensory inhibition to the uterus. The placenta is carefully inspected as a routine procedure, and no ragged mangled maternal surfaces have been seen. Smooth, regular cotyledons with very few occasional and small clots attached is the rule. Involution of the uterus, after caudal analgesia, is definitely more prompt; in the past year rarely have we seen the subinvolution which occasionally was found in routine daily fundal palpation. The lochial flow is decreased and is usually only slightly serosanguineous at the end of the first week. Rarely are blood clots seen in the lochial discharge.

The placental attachment was carefully observed in 75 cases of cesarean section done under this analgesia. The peritoneal area on the outer surface was remarkable in that it was always found to be very pale and decidedly more crinkled or puckered than in sections done under spinal or inhalation anesthesia. This phenomenal characteristic remained and was noted to be present even after the placenta and membranes were lifted out of the uterus; it was still present when the uterine closure was completed. As Lahmann and Mietus³⁶ have pointed out in their work on single

shot caudal anesthesia for cesarean section, the uterus retains its tone, placental separation is rapid and there is a minimal blood loss. Another observation of moment made by us was that in cesarean section, low or classic type, the uterine myometrial bleeding on incision was decidedly diminished. The sinuses appeared to close more promptly, rapidly and effectively than in those instances in which intravenous ergot preparations were used.

Possibly because of widespread use of caudal analgesia and anesthesia it may be necessary to rewrite the mechanism of the third stage of labor. On the other hand, the use of continuous caudal analgesia and anesthesia may have resulted in no new mechanism for the third stage of labor but, rather, has enabled the uterus to approach more closely its normal mechanism.

SUMMARY AND CONCLUSIONS

The blood loss determinations were estimations made by measuring the blood lost from termination of the second stage of labor up to and including the first hour post partum.

The blood loss during the third stage of labor has been decreased decidedly since the adaptation of continuous caudal analgesia and anesthesia. No patient under caudal anesthesia had a blood loss of 501 cc. or more as compared with 28 patients who had a blood loss of 501 cc. or more under inhalation anesthesia. Of the patients delivered under continuous caudal analgesia 97.4 per cent fall into the blood loss group 0-250 cc. as compared with 79.1 per cent of the patients delivered under inhalation anesthesia.

The duration of the third stage of labor in patients under continuous caudal analgesia and anesthesia has been definitely shortened as compared with the third stage of labor in patients under inhalation anesthesia. There were but 2 instances of a third stage of labor prolonged beyond thirty-one minutes under continuous caudal analgesia and anesthesia as compared with 17 instances under inhalation anesthesia.

The incidence of "trapped" placenta in the 1,000 cases delivered under continuous caudal analgesia was 0.1 per cent. There were 6 instances in which manual removal of the secundines was needed in the inhalation anesthesia group.

The observation that the uterine myometrial bleeding on incision at the time of cesarean section is decidedly diminished.

It is believed that continuous caudal analgesia and anesthesia in obstetrics enables the uterus to approach its normal mechanism more closely.

Systematic Registration of Vital Statistics.—The systematic registration of vital statistics, on which so much of our modern information about public health depends, was begun in the Scandinavian countries. Since 1686 Swedish ecclesiastical law has required the clergy to keep records of marriages, births, deaths and of all persons moving into or leaving the parish, but these records were at first irregular and incomplete. In 1748 the Swedish Riksdag passed a comprehensive law to regulate the recording and compilation of these parish statistics. It also provided for a census. Sweden therefore has an unbroken series of vital statistics dating back to 1749, a unique contribution to public health. In Norway the recording of parish vital statistics was begun in 1735, and the first census was made in 1769.—Haagensen, C. D., and Lloyd, Wyndham E. B.; *A Hundred Years of Medicine*, New York, Sheridan House, Inc., 1943.

³⁶ Lahmann, A. H., and Mietus, A. C.: *Am. J. Obst. & Gynec.* 46: 274, 1943.

"COLD VACCINES" AND THE INCIDENCE OF THE COMMON COLD

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Since the days of Pasteur the use of bacterial vaccines for the prophylaxis of disease has intrigued physicians and patients alike. In the case of the common cold, efforts to find an effective vaccine have continued in spite of the lack of evidence of a noteworthy immunity following the actual infection. In clinical experience neither the virus of the common cold nor the associated bacterial flora shows significant antigenicity in the majority of men and women.

In view of the large proportion of mankind affected and the present lack of suitable means of protection against epidemic coryza and related respiratory infections, it is understandable that efforts to find an effective vaccine should continue in spite of repeated failures. The leading role of respiratory infections as a cause for absenteeism from work in industry has drawn the attention of physicians to the economic aspect of the problem of such infections.¹ There has been considerable emphasis among industrial groups on the various procedures which held any chance of reducing either the incidence or the severity of colds and their sequelae. Such emphasis during the past two years has been reinforced by a laudable desire to increase the number of working days of a nation in an "all out" war.

The apparent results of efforts to vaccinate against the common cold, the character of the vaccines proposed and the methods of administration show a confusing variability in medical reports. Where suitable controls have been used, "mixed catarrhal" vaccines (orally or by subcutaneous or intradermal injection) have generally failed to show effectiveness in preventing colds in unselected groups.² Likewise the bacteria free filtrable virus which has been shown to produce colds under experimental conditions has failed to "vaccinate" in immunization studies.³ On the other hand, there are numerous reports suggesting from slight to pronounced degrees of protection against the common cold following oral or parenteral administration of vaccine.⁴

However, the evidence for concluding that vaccination against the common cold and related respiratory infections is effective is for the most part unimpressive, incomplete and poorly documented.

The lack of unanimity of opinion among those who have conducted experimental trials with various vaccines undoubtedly arises from a number of factors. The common cold is not a clearcut disease entity but rather a symptom complex which may follow irritation of the nose and throat by various chemical and physical agents as well as by infection. There is an element of suggestion affecting the frequency and severity of coryza among any group of persons cooperating in the evaluation of a given form of prevention. The use of placebo medication cannot be avoided if any importance is to be attached to the results reported by the subjects under observation. The common cold is usually diagnosed subjectively. There is no simple objective diagnostic measure for the infection, no ready differentiation of that form of rhinitis from the rhinitis of pollen allergy or other agents. Not all such infections in a large experimental group are seen by the physician making a study of the prophylactic effectiveness of a vaccine.

There are, furthermore, spontaneous fluctuations in the number and severity of colds within a season, from season to season, within a geographic area and from area to area. What is considered a severe cold by one subject is called a mild cold by another. Many trials at experimental prophylaxis depend on reports given from memory by the subjects at the end of a year or at the end of a season. We have discovered that some persons may forget even the occurrence of a cold within a few weeks, to say nothing of its severity or complications. Where the vaccine is to be taken at regular intervals for a period as long as from October to April, the inevitable irregularities and lapses in administration tend to vitiate the results. These and related difficulties in using human cold sufferers as subjects for the assay of a prophylactic procedure must be kept in mind by any one attempting such prophylaxis.

Among industrial workers certain of the variables in the clinical trial of vaccines can be reasonably well controlled. The subjects live under known and frequently comparable working conditions. Their home environment is fairly well known even when not constant throughout a given group. The subjects are available for observation at the plant medical unit as often as is necessary. There are nurses, clerks and other attendants to check in person or by telephone on the occurrence of respiratory infections at weekly, fortnightly or monthly intervals. In addition the record of absenteeism kept by many industrial groups affords a qualified check on absences from all illness and injuries.

EXPERIMENTAL

The data presented here are compiled from the records kept by the medical departments of representative plants and offices participating in an attempt (a) to lower the

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(Footnote 4 continued in next column)

amount of lost time from respiratory infections by the use of vaccine and (b) to demonstrate the effectiveness of cold vaccines in an unselected industrial population if such effectiveness exists. Our experience with the administration of cold vaccine concerns men and women of ages from 19 to 68 years and covers the October to April period of 1941-42 and 1942-43. Five geographic locations are represented by two eastern plants, a midwestern plant, a group of office workers on the eastern seaboard and a group of office workers in a midwestern city.

The prophylactic medication used included two representative cold vaccines for hypodermic use and three such vaccines for oral use. These vaccines were stock preparations furnished by manufacturing pharmaceutical firms. Control studies included the use of placebos, orally and subcutaneously, as well as an untreated group of employees who cooperated in the experiment by reporting colds while making no specific effort at prophylaxis. Each oral vaccine was administered according to the recommendations of the manufacturer, usually by having the subject take one dose into the empty stomach daily for seven to ten days and then one dose two or three times weekly for the remainder of the cold season. In the case of the hypodermic vaccine,

work because of such infections and the severity of the infections (number of days absent due to an infection) were recorded. The reports of those subjects who discontinued the use of or were irregular in taking vaccine have been omitted from the data. No significant differences were noted between the response of subjects from one geographic area and that of subjects from another area. The accompanying table shows a summary of the collective data.

An examination of the average number of colds suffered per person, the number of days lost per person because of these infections and the number of days lost per infection suggests no outstanding value for any vaccine included in this clinical test. By assigning possible significance to slight differences to the arithmetical averages of the various categories shown in the table, one notes the following:

- (a) The fewest colds developed in groups receiving either Vacagen, Sharp & Dohme vaccine for parenteral use or a placebo by mouth.
- (b) Groups receiving Oravax, a placebo (orally or hypodermically) or taking no prophylactic medication at all lost fewest days from work because of colds.
- (c) Groups receiving a placebo hypodermically, Oravax or nothing at all have the mildest infections

Summary of Experience with Cold Vaccines (October to April, 1941-42 and 1942-43)

Character of Group	Number of Persons in Group	Number of Colds Reported by Group	Number of Working Days Lost by Group Because of Colds	Number of Colds per Person	Number of Working Days Lost per Person Because of Colds	Number of Days Lost per Cold
Vaccine given subcutaneously (Sharp & Dohme).....	283	189	236.5	0.66	0.82	1.25
Vaccine given subcutaneously (Parke-Davis).....	94	83	107.5	0.88	2.1	2.38
Placebo given subcutaneously.....	89	124	42.0	1.39	0.47	0.34
Vacagen.....	334	217	216.5	0.65	0.65	1.0
Entoral.....	121	239	111.0	1.98	0.92	0.46
Oravax.....	193	190	73.5	0.96	0.37	0.39
Placebo given orally.....	239	165	144.5	0.69	0.60	0.88
Untreated control.....	228	286	115.0	1.25	0.50	0.40
Totals						
Vaccines given subcutaneously.....	109	291	453.0	0.71	1.11	1.56
Vaccines given orally.....	633	646	401.0	0.99	0.61	0.62

starting with 0.1 cc., gradually increasing doses were given at weekly intervals until a dose of 1 cc. was reached. The latter dose was repeated at either biweekly or monthly intervals throughout the cold season.

Only a limited supply of oral vaccine was issued at one time to a subject, usually enough for two weeks' treatment, never more than enough for a month's treatment. This frequent contact enables the physicians and nurses to check, at frequent intervals, on the actual use of the medication and on the occurrence of acute colds. Additional contacts were made by telephone and by visits of a member of the medical unit to the subject at the latter's place of work when needed to secure information pertinent to the study. No effort was made to use vaccine for treatment of an acute cold. The subjects were instructed to follow their schedule of medication regardless of the appearance of an acute respiratory infection.

Subjects were selected at random for either vaccine or placebo medication in the hope that such aberrant factors as occupation, number of previous colds, exposure and sex would not unduly weight the results for any particular group. In many instances those subjects who received vaccine during the season 1941-42 received the placebo (of the same size and appearance as the vaccine) during the season 1942-43 and vice versa. In each instance the number of colds suffered, the absences from

(measured by the length of absence per acute cold reported).

In view of the behavior of the control groups, we find no evidence of clearly effective prophylaxis against either the frequency or the severity (including complications) of the common cold from the use of any of the vaccines studied.

Our experience with office and industrial workers thus confirms the findings of Diehl, Baker and Cowan,⁵ and of the Hausers⁶ for university students and the experience of Blitch and Doyle⁷ for military personnel. This is an unfortunate state of affairs in view of the present importance of industrial absenteeism because of acute respiratory infections. We must conclude that there is nothing to recommend the indiscriminate use in industry of any cold vaccine included in this investigation. In fact, any genuine improvement in our situation with the common cold appears to lie in a direction entirely different from that of the vaccine approach.

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SUMMARY

1. Three oral vaccines and two vaccines for parenteral administration currently offered as prophylaxis against the common cold were given clinical trials in a group of industrial and office workers during the October to April season of 1941-42 and 1942-43.

2. No clearly evident protection against the cold and related acute respiratory infections can be demonstrated in the results of this clinical trial at mass immunization.

3. The indiscriminate use of cold vaccine now available is not the answer to the problem of industrial absenteeism due to acute respiratory infections.

PRIMARY PULMONARY COCCIDIOIDOMYCOSIS

FOLLOW-UP OF 75 CASES, WITH 10 MORE CASES
FROM A NEW ENDEMIC AREA

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The pulmonary infection caused by the fungus *Coccidioides immitis* is of importance principally to civilian and military doctors in the state of California and of secondary interest to our colleagues in Arizona,¹ New Mexico and West Texas. It should also be of interest to all the medical profession throughout the United States because of the present rapid migration of both military and civilian personnel. The two series presented here represent the largest number of patients any group of authors has been able completely to observe, diagnose and treat. The patients we observed here had the benign, primary, pulmonary form and not the granulomatous type, which Gifford² and Dickson³ proved not to be a disease entity but simply the sequela or result of wide dissemination of the fungus. Our first series⁴ of 75 patients developed the disease after a trip to Antelope Plains, Calif.; the second series of patients were exposed in Pallen Pass, which is near the California-Arizona border. Careful clinical histories were taken of the 10 patients in our second series and it was found in each instance that the patient had been at Pallen Pass fourteen to twenty-one days previously. There was no exception to this statement, and we believe that this is a new endemic area in California. The terrain in the two areas is essentially the same, having a 3 inch fine top sand, which is an excellent medium for the chlamydospores of the fungus⁵ in the vegetative phase. It is by means of this dust in the air that the fungus is readily transported and so inhaled into the lungs. Most of the inhabitants of these areas usually, unknowingly, have their primary infection during the first year of residence and are subsequently immune. A few of these develop clinical symptoms and a certain number manifest a greater allergic response such as erythema nodosum. This is colloquially called

"valley fever," "desert fever" or "desert rheumatism." The more pronounced form that we have encountered in our two series of cases is known as primary pulmonary coccidioidomycosis.

Primary pulmonary coccidioidomycosis has a high morbidity and a low mortality, and this fact is again borne out by the original series of 75 patients. All of these have returned to duty. Cavity formation occurred in 3 of the patients. This has been observed and reported previously.⁶ Two of the patients had multiple cavities that closed spontaneously after a period of three to five months and they were reclassified and returned to continental noncombat duty. The third patient had two cavities, one of which persisted despite regression of the other pulmonary lesions and the hilar adenopathy. The latter cavity did not change in size or shape over a period of six months and the patient was therefore sent to a general hospital. He was later sent to continental noncombat service, presumably the lesion having healed. Apparently all 3 have done this type of duty in a satisfactory manner.

The initial infection was manifested in 3 instances by primary pleuritic effusion no different from that often seen in pulmonary tuberculosis with the exception that *Coccidioides immitis* may be recovered from the pleural fluid and serologic tests are often positive. Two of these patients returned to full field duty in three to five months. The third patient in addition had pneumonic consolidation and developed two verrucous granulomas of the skin. This circumstance was of particular interest for many reasons. First, because the blood precipitin and complement fixation tests done by Dr. C. E. Smith at Stanford University School of Medicine showed that the disease was disseminating and that the patient, therefore, should be developing granuloma. This occurred as predicted. Second, during the critical stage of this patient's illness, while he was in an oxygen tent and the prognosis was grave, he was given whole blood from 1 of the convalescent patients whose blood was of high precipitin titer without complement fixation titer. Immediately after the second transfusion his temperature dropped to 100 F. and remained below that level until final discharge from the hospital. Third, sulfadiazine and sulfanilamide were used separately during the stage of acute pneumonic consolidation and proved to be of no value. Fourth, this patient is an American Indian, the only one in our series, which emphasizes the fact that dark skinned people are more likely to have severe infections and to develop sequelae or dissemination. And last, although there was no precedent noted in the literature, the granulomas were removed surgically with wide excision, and there has been no sinus formation nor recurrence. He was reclassified and returned to continental noncombat duty, which he has capably performed.

Except for these 6 patients, all of this series have returned to full field duty.

CLINICAL PATHOLOGY

Primary pulmonary coccidioidomycosis is an acute infectious disease caused by inhalation of the fungus *Coccidioides immitis*. The coccidioidal granuloma was first described by Wernicke⁷ and Posodas about 1892 in Argentina, but in 1937 it was recognized by Dickson⁸

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7. Wernicke, R.: Ueber einen Protozoenbefund bei Mycosis fungoides, *Centralbl. f. Bakt.* **12**: 859, 1892.

8. Dickson, E. C.: Coccidioides Infection, *Arch. Int. Med.* **59**: 1920-1944 (June) 1937.

to be the sequela or product of dissemination of the benign primary form we describe here rather than a disease entity in itself as was previously thought. Cronkite and Lack⁹ in conditioned inhalation experiments with guinea pigs have attempted to present a microscopic study of the primary disease by experimentally infecting 42 per cent of 72 guinea pigs. This work was accomplished by allowing the animals to inhale the chlamydospores. The primary pulmonary infection appeared after eight to twenty-one days; it consisted of an area of small grayish nodules, each varying up to 5 mm. in diameter, which grossly resembled the lesions of miliary tuberculosis. Microscopically they appeared as granulomas, showing slight alveolar exudate but with involvement of the interstitial spaces. However, the older lesions became fibrous as the exudate was replaced by giant cells, mononuclear cells and epithelioid cells. Microscopic studies of the primary disease in our series are not available. Caldwell,¹⁰ on autopsies of the lungs of patients dying from coccidioidal granuloma elsewhere in the body, showed lesions of a similar nature.

Skin Manifestations

Patient with Rash	Days from Onset to Eruption	Maximum Percentage Eosinophilia	Coccidioidin Skin Test, No. Mm. Erythema 48 Hr.		Tuberculin Patch Test
			1:1,000	1:100	
1	16	10	20	55	—
2	23	2	10	50	—
3	18	2	15	50	+
4	7	12	20	60	—
5	10	22	25	40	—
6	12	4	10	40	—
7	14	7	25	40	+
8	23	2	10	10	—
9	28	1	15	25	—
10	3	8	20	40	—
11	8	2	3	14	+
12	14	10	15	60	—
13	5	10	18	45	—
14	6	9	5	25	—
15*	12	6	40	70	—
16*	9	0	12	45	—
17*	11	6	30	75	—
18	8	7	25	50	+
19†	12	8	15	35	—
20†	14	3	20	45	—
21†	7	1	15	30	—
22†	10	2	10	30	—
23	21	1	10	20	—

No symbol, erythema nodosum; * erythema multiforme; † morbilliform rash.

Coccidioidal granuloma has a mortality of 50 to 60 per cent.¹¹ It is characterized by intrapulmonary or extrapulmonary papular lesions which result in necrotic formation. The incidence of development of granuloma following the acute primary pulmonary infection is not definitely established; most authors agree that it is uncommon. Granulomas have been found in the lungs, skin, bone and brain. Although meningitis did not occur in our series, it is not infrequent. We had one example of granulomas of the skin.

CLINICAL SIGNS AND SYMPTOMS

Primary pulmonary coccidioidomycosis is not difficult to recognize if it is included in the differential diagnosis. This is especially true if the patient gives a history of residence in an endemic area. Also one

should always consider this condition if a patient suspected of having pulmonary tuberculosis¹² continually has negative sputum.

We have combined clinical and laboratory data from the two series in an attempt to give a better understanding of this infection, since it has assumed much greater importance than the medical profession had anticipated. There was only one manifestation, namely morbilliform rash, occurring in the second series of 10 that were not seen in the first group. We were impressed by the mildness of the disease in the second group, and this suggested that the fungus might be less virulent in different endemic areas.

1. *Thoracic Pain.*—This was an early and prominent symptom occurring in 88 per cent of the patients. The pain was always accentuated by cough and deep inspiration. In the majority of instances the pain was bilateral and persisted after other symptoms had disappeared.

2. *Cough.*—This symptom was present in 88 per cent of the patients, and these patients stated that fine particles of dust or sand were present in the sputum. The cough was moderately productive in 65 per cent. Hemoptysis¹³ was present in 18 per cent, but it had no correlation with the severity of the disease or the type of pathologic condition of the lung.

3. *Chills and Fever.*—Chills were a frequent symptom experienced by 66 per cent of the patients. The duration of the chill was from a few minutes to an hour, and this recurred during a period of four days in some cases.

Fever was a constant finding. The temperature ranged from 98.8 to 104 F., but only 5 patients had a temperature over 102 F. Afternoon temperature continued elevated into the second and third months of hospitalization in a few instances.

4. *Sore Throat.*—This was noted in 37 per cent of the patients and was usually described as slight. In these cases only 11 or 12 per cent had definite tonsillitis or pharyngitis.

5. *Examination of the Chest.*—Physical signs were present in only 26 per cent of the series. The most common description was "harsh, rough breath sounds." Rales were infrequent; classic signs of consolidation and effusion were present in several cases.

6. *Cutaneous Manifestations.*—The incubation period was one to three weeks and the cutaneous manifestations occurred eight to fourteen days later, as shown in the table. In our first series of 75 patients erythema nodosum occurred in 19 per cent, erythema multiforme occurred in 2.6 per cent, while 1 patient had both types of erythema. Erythema nodosum has been previously reported by other authors in 2 to 5 per cent¹⁴ of their patients.

In our recent series of 10 patients a morbilliform rash was occasionally noted. It was confined to the trunk and lower extremities and was present in 40 per cent. A few authors have stressed the relationship of skin manifestations to eosinophilia; this is only slightly evident in our cases, as shown in the table.

9. Cronkite, A. E., and Lack, A. R.: Primary Pulmonary Coccidioidomycosis, J. Exper. Med. 72: 167-174 (Aug.) 1940.
10. Caldwell, George T.: Secondary (Granulomatous) Coccidioidomycosis—Coccidioidal Granuloma, Texas State J. Med. 38: 376-382 (Oct.) 1942.
11. Carter, Ray: Roentgen Diagnosis of Fungus Infections of the Lungs with a Special Reference to Coccidioidomycosis, Radiology 38: 649-659 (June) 1942.
12. Winn, W. A., and Johnson, G. H.: Primary Coccidioidomycosis: A Roentgenographic Study of Forty Cases, Ann. Int. Med. 17: 407-422 (Sept.) 1942.
13. Winn, W. A.: The Treatment of Pulmonary Cavitation Due to Coccidioidal Infection, California & West. Med. 57: 45-47 (July) 1942.
14. Smith, C. E.: Epidemiology of Acute Coccidioidomycosis with Erythema Nodosum ("San Joaquin" or "Valley Fever"), Am. J. Pub. Health 30: 600-611 (June) 1940.

7. *Arthralgia*.—It was found that 28 per cent of the patients complained of aches or pains in the joints during the course of the disease. The pain was dull and usually localized in the lumbar spine or lower extremities. There was no local swelling nor tenderness of the joints, and roentgenograms were negative.

LABORATORY AIDS AND SKIN TESTS

1. *White Blood Cell Count and Differential*.—The white blood cell count was found to be of little diagnostic value; the counts ranged from normal to 29,000 cells and averaged about 11,000 cells. The eosinophilia, which some authors felt was diagnostic, was at its peak in the second or third week, averaging 6 to 8 per cent, as shown in the table.

2. *Sedimentation Rate*.—The modified Cutler method with a normal value of 10 mm. in sixty minutes was employed. On admission, nearly all patients had an elevated sedimentation rate; the range varied up to 56 mm. in sixty minutes. On discharge to duty all patients had a sedimentation rate less than 15 mm. in sixty minutes.

3. *Weltmann Test*.—This is a test described earlier and recently revised which we have employed in conjunction with the sedimentation rate. It was brought back into use because of its value in pulmonary tuberculosis, since it is believed to show proliferation of cells and therefore activity which may not be evident in temperature charts or sedimentation rates. Because of the similarity of this disease and pulmonary tuberculosis, we felt that it might be of some value. A detailed report cannot be given in this paper; but in many instances when the patients still had complaints in spite of an afebrile course and a normal sedimentation rate, the Weltmann band was found to be high, showing evidence of proliferative activity. The latter circumstance was the basis for further hospitalization.

4. *Tuberculin Patch Test*.—The parallelism between pulmonary tuberculosis and pulmonary coccidioidomycosis has been stressed by many authors, notably Smith.¹⁵ For this reason all patients were tested by the tuberculin skin test; the method employed was the Vollmer patch test. Of the 85 patients 42 per cent gave a positive test while 58 per cent gave a negative reaction. Six samples of sputum were obtained from each patient and examined for the presence of tubercle bacilli. In no instance was any acid fast organism found. The percentage of positive patch tests in this series would be equal to that found in the general population, as shown in the table.

5. *Coccidioidin Skin Test*.—This test is of great value in the diagnosis of coccidioidomycosis. A negative test usually excludes the possibility of infection, whereas a positive test is indicative of past or present infection. Coccidioidin as prepared by Smith was used, and 0.1 cc. dilution of 1:100 and 1:1,000 was injected intracutaneously by means of new tuberculin syringes and small gage needles. The control was 0.1 cc. of 1:10 dilution of the Bureau of Animal Industry synthetic medium injected in a similar manner. Readings were made at twenty-four, forty-eight and seventy-two hours and the results recorded in millimeters of erythema and induration. Reactions of 5 mm. or more at forty-eight hours were considered positive (fig. 1). All of the

85 patients gave positive reactions. It is our impression that the reactions were most pronounced at forty-eight hours, as shown in the table. In the entire series only one untoward reaction was noted. This patient developed a lymphangitis and axillary lymphadenopathy following a very strong allergic response. Erythema nodosum did not occur in any of our cases as the result of the coccidioidin skin test, although this has been reported by Kessel.¹⁶

6. *Blood Precipitin and Complement Fixation Tests*.—Serologic tests were performed on all patients by Dr. C. E. Smith and Miss R. J. Wheatlake. In many instances sputum cultures were also done. It is the

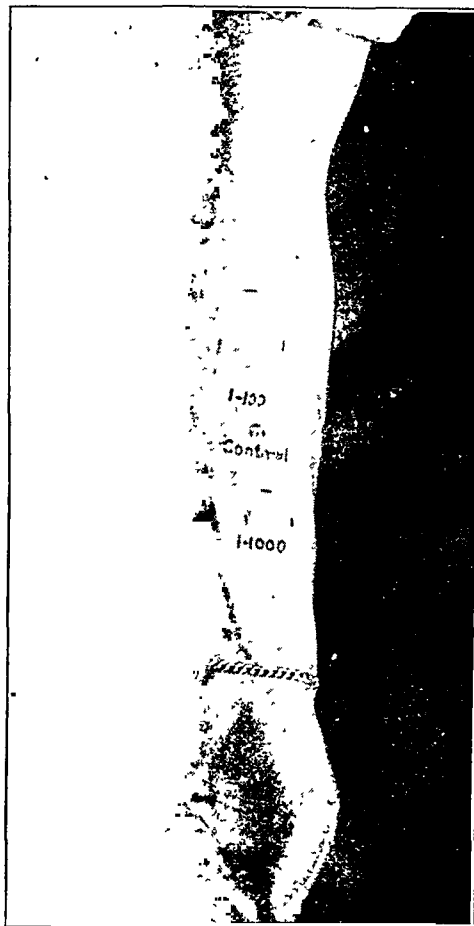


Fig. 1.—Positive coccidioidin skin test at optimum time of reading, forty-eight hours.

opinion of Dr. Smith that a positive serologic test is diagnostic but that a negative test does not necessarily exclude the infection, since humoral antibodies may rapidly disappear. When dissemination of the granuloma occurs the complement fixation titer is high and the precipitin titer is low. On the other hand, primary infections show a high precipitin titer and a low or absent complement fixation titer. Thus the serologic tests possess a prognostic as well as diagnostic value.

7. *Sputum*.—Six sputums from each patient were examined for acid fast bacilli. It is our opinion that examination for the double refractive bodies of the fungus on smear is too inaccurate to be of value. This opinion is also shared by Dr. Smith.¹⁵ However, posi-

15. Smith, C. E.: Parallelism of Coccidioidin and Tuberculous Infections, *Radiology* 38: 643-648 (June) 1942.

16. Kessel, J. F.: The Coccidioidin Skin Test, *Am. J. Trop. Med.* 19: 199-204 (March) 1939.

tive sputum cultures were often obtained by inoculation on Sabouraud's medium, but owing to the danger of infection even by experienced laboratory personnel we believe this diagnostic procedure should be limited to otherwise undiagnosed cases.

8. *Roentgenology*.—Serial roentgenograms of the chest were taken of all patients as long as activity by x-ray could be demonstrated and if the clinical course warranted.

It is not our intention to discuss fully the radiographic findings of this disease. We may state briefly that there are no typical roentgenologic findings, but among our 85 patients the more common report stated "The hilar shadows are enlarged on one or both sides, associated with increased bronchovascular markings extending into the parenchyma of the involved regions."¹⁷ Most of the roentgenograms showed gradual clearing in the ensuing weeks. A slightly increased hilar shadow may persist for several months with no other clinical or laboratory evidence of disease, and these patients may be returned to duty if no other signs of activity are present.



Fig. 2.—Thin walled cavity with a small amount of peripheral reaction present in the left upper lobe. The persistence of this cystlike cavity was due to bronchostenosis with ball valve pressure effects.

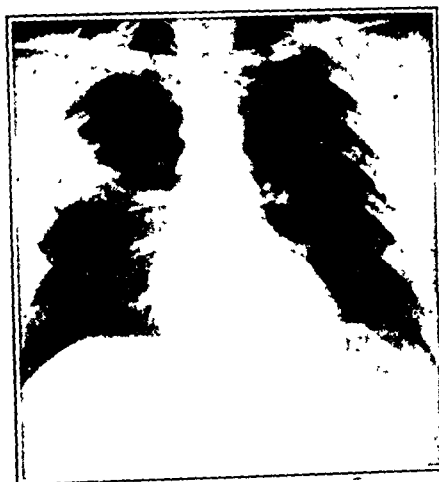


Fig. 3.—Peripheral lobular exudative infiltrative lesion. Associated regional pleuritis cleared fairly rapidly, but parenchymal lesion resolution was characteristically slow.

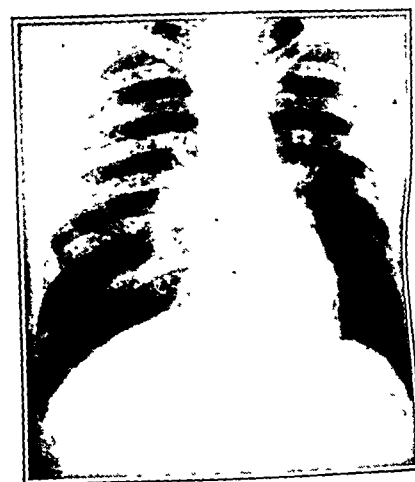


Fig. 4.—Strong right hilar shadow prominence and confluence with extension of infiltrates into lower lung field. Resembles bronchopneumonia except for delayed resolution.

We have selected certain roentgenograms from our series of cases as illustrative of important roentgenographic aspects of the primary infection (figs. 2, 3 and 4).

Roentgenology is of paramount importance in diagnosing certain sequelae. Cavity formation occurred in 3 of our patients, and initial infection was manifested in 3 other cases by primary pleuritic effusion. These cases with their radiographic progress were more fully discussed at the beginning of this paper.

Bronchopneumonic consolidation of lobar distribution was seen not infrequently and usually regressed in a few weeks.

TREATMENT

The mode of therapy parallels¹⁸ closely that of tuberculosis, usually without pneumothorax or surgical intervention. In our series we found pneumothorax unnecessary, but Winn¹⁸ has reported favorable results in cases of cavitation with persistent hemoptysis. This infection does not pass directly from host to host; there-

fore patients cannot be considered a menace to society even though sputum contains the endospores or spherules. Only the chlamydospores found in the desert dust or sand are infectious to nonimmune persons.

We concur with others that symptomatic conservative treatment is the method of choice, emphasis being placed on bed rest, adequate fluids, high caloric high vitamin diet and sedatives. Salicylates and iodides have been found to be advantageous for the relief of arthralgia.

Convalescent blood with high precipitin titer was obtained from 2 donors and used to transfuse 2 patients who were critically ill with pulmonary consolidation and effusion. Both of these patients demonstrated immediate clinical improvement. Evaluation of this type of therapy cannot be deduced from these 2 isolated instances.

As previously stated, the 2 verrucous granulomas of the skin were treated by surgery with wide excision. The wounds healed slowly and completely without sinus formation, and there was no recurrence. This treatment has apparently never previously been used, so we offer no further comment on this 1 case.

Sulfonamides were given in various phases of the disease and were found to be of no value.¹⁹

The criteria for discharge from the hospital were a sedimentation rate of 15 mm. or less in sixty minutes and a Weltmann test showing a normal band.

COMMENT

In our 85 cases of primary pulmonary coccidioidomycosis no deaths occurred. Two coccidioidal verrucous granulomatous skin lesions developed on 1 patient, 1 lesion on the scalp and the other on the shoulder; both were removed surgically, and sections of the tissue confirmed the diagnosis. The wounds healed slowly with no recurrence. This secondary manifestation of coccidioidomycosis seldom occurs and when present is pro-

19. Sulfanilamide and sulfadiazine were used without any therapeutic benefit. H. C. Hinshaw reported at a Mayo staff meeting that promin gives promise in the treatment of pulmonary tuberculosis. We have also seen recovery occur in 1 case of tuberculous meningitis, and the only drug used was Parke-Davis M. 12. Considering the clinical similarity of the two diseases, although the cause of one is a bacillus and the other a fungus, it is suggested that these drugs may be of value. W. E. Herrell at the Mayo Clinic stated that penicillin in a dilution as small as 1 to 1 million is highly effective in the treatment of actinomycosis. However, penicillin has recently been used on the granulomas of coccidioidomycosis without therapeutic effect. We have no basis for comment as to whether it would be of value in the acutely ill primary infection or the disseminating phase of the latter disease.

17. Colburn, J. R.: Roentgenological Types of Pulmonary Lesions of Primary Pulmonary Coccidioidomycosis, unpublished data.
18. Winn, W. A.: Pulmonary Cavitation Associated with Coccidioidal Infection, *Arch. Int. Med.* 68: 1179-1214 (Dec.) 1941.

uced by dissemination of the disease through the blood or lymph stream from the primary pulmonary infection. Dissemination of the disease from its primary focus in the body is uncommon and most authors agree that this occurs in about 0.05 per cent of cases.

In the series of 75 patients 3 developed pulmonary cavitation and 3 developed pleural effusion. Fortunately these 6 pulmonary lesions occurred early in the course of the disease, which is characteristic of primary, localized coccidioidomycosis in contrast to the same types of lesions in tuberculosis which occur late, usually as a result of endogenous reinfection. It is generally conceded and was evident in these patients that once the infection is cured completely the healing is permanent. Some authors have assumed that reinfection may be endogenous; however, we believe that cure was not complete in those instances in which reinfection was predicated. It appears obvious to us that there are many individuals in whom only the allergy caused by infection is produced; in these instances the subclinical course is asymptomatic.

SUMMARY

1. In the follow-up study of 75 patients with primary pulmonary coccidioidomycosis, all patients returned to full duty in three to five months except 6, who were reclassified to continental noncombat duty in eight months. One of these had pneumonic consolidation with effusion and 2 verrucous granulomatous skin lesions; another had 2 pulmonic parenchymal cavities.

2. Ten more cases were reported from a new endemic area in the state of California; 4 of these showed morbilliform skin manifestation. These patients appeared to have had a milder infection, and all will be returned to duty with a maximum of three months' hospitalization.

3. Erythema nodosum has been previously reported to occur in 2 to 5 per cent of all cases; however, in our 85 cases it appeared in 19 per cent.

4. *Coccidioides immitis* exists in the vegetative phase as chlamydospores, which are in the soil in parts of the desert sections of the states of California, Arizona, New Mexico and West Texas. Here the fungus may be inhaled from the dust and pulmonary infections follow. Infection does not pass from host to host, and therefore patients are not a menace to society.

5. This infection should be considered in a differential diagnosis if a history of residence in an endemic area is obtained or a suspected tuberculous patient has negative sputums.

6. When cure has been complete, reinfection does not occur.

7. Many subclinical cases occur in which only allergy is produced without clinical manifestations.

8. There is relatively little mortality to primary pulmonary coccidioidomycosis, but the morbidity is high.

9. Sulfonamide chemotherapy was given in various phases of the disease and was found to be of no value.

10. Two acutely ill patients who were treated with high precipitin titer convalescent blood had almost immediate improvement. Two verrucous skin granulomas were widely excised; there were no complications nor recurrence. These are new therapeutic procedures, and therefore no claims will be made on so limited clinical material.

PAROXYSMAL ABDOMINAL PAIN

A FORM OF FOCAL SYMPTOMATIC EPILEPSY

MATTHEW T. MOORE, M.D.

PHILADELPHIA

Auras of somatic and visceral sensibility are commonly experienced as part of the epileptic sequence of events, and their diverse varieties have been fully described in a prolific literature on the subject. The "sensory march" of the jacksonian fit and the variegated epigastric aura represent the sensory component of what may or may not terminate in the motor expression of the epileptic attack. These sensory manifestations may include the element of pain, but usually they are not confined to a single somatic segment or focal visceral area. Localized pain, as an isolated phenomenon not associated with somatic convulsive seizures or with other motor, sensory or psychic variants of epilepsy would rarely be considered a form of epilepsy even though its occurrence was episodic and paroxysmal. However, it was conjectured prophetically without benefit of electroencephalography by Wilson¹ in 1928.

The frequency with which unexplained abdominal pain occurs both in children and in young adults makes it advisable that all available methods be utilized in arriving at a differential diagnosis. This is particularly important in that such persons may be subjected to unnecessary operations and suffer on because of continued negative findings after intensive study and then are thrown into the diagnostic discard as hysterical or psychoneurotic.

The person who forms the subject of this report had isolated paroxysmal abdominal pain coming on at irregular intervals over a period of twenty-nine years. Extensive studies had failed to reveal organic abdominal visceral disease and medication had afforded no relief prior to the use of anticonvulsant drugs. Electroencephalography showed abnormal waves particularly in the right and left frontal lobes.

REPORT OF CASE

History.—P. P., a man aged 32, was referred by Dr. Marcel Sussman on June 4, 1941 offering as the chief complaint periodic attacks of cramplike pain involving the entire abdomen. The pain often started in the lower right quadrant and then involved the abdomen throughout. At times the pain became so severe as to produce prostration and loss of weight. Despite the severity of the attacks, he did not experience nausea and did not vomit. During the attack he had a "rumbling" sensation in the abdomen associated with considerable eructation. The seizures were not accompanied by headache or visual disturbances. He had never had diarrhea during a spell. Following the attack he was exhausted and felt "achy all over." He had never been aware of premonitory symptoms which might constitute an aura. The attacks lasted two hours or more, during which time the pain was constant and unremitting. Abdominal pain had on occasion endured for two days. During recent months the attacks occurred every seven or eight days and he had four seizures during the preceding week.

The first attack occurred at the age of 9 months. Shortly before this he had had diphtheria and had received antitoxin. The seizures of abdominal pain came on at irregular intervals during his early life and appeared more frequently during stages in his life when he was subjected to nervous stresses.

From the Doctors Hospital, Philadelphia.
Read before the Philadelphia Neurological Society, Nov. 26, 1943.
1. Wilson, S. A. K.: *Epileptic Variants*, J. Neurol. & Psychopath. 8: 223, 1927-1928; *Modern Problems in Neurology*, London, Edward Arnold & Co., 1928.

For example he invariably suffered a severe attack during examinations at school, and thereafter the attacks would cease for a considerable time. The longest attack free interval was fourteen months, following his graduation from college. At the age of 8 an appendectomy was performed during one of the attacks and a normal appendix was removed. Until three years before admission he had urticaria after eating certain foods, especially watermelon. At the age of 16 he cut himself with a piece of glass, and an attending physician administered antitetanus serum. Almost immediately after the injection he became extremely ill and had one of his usual attacks. For two days he had urticaria and a high fever.

He had been studied extensively and intensively in many hospitals and clinics without any definite etiologic factor being unearthed. The only positive findings of significance were extensive pyorrhea and apical abscesses involving several teeth, and tests for allergens, which showed a possible allergic background. At one clinic the findings of extensive studies were negative; however, an abdominal exploration was suggested but not urged. Here it was felt that there seemed to be quite a pronounced nervous element in the patient's makeup and in his condition during some of his acute attacks. The diagnoses which had been entertained during the past years were (1) hysteria, (2) abdominal angioneurotic edema, (3) abdominal migraine, (4) psychogenic functional gastrointestinal disorder, (5) hepatobiliary disease, (6) enlarged colon, (7) Dietl's crisis and (8) diaphragmatic hernia. He received various forms of medication, including ergotamine tartrate, but obtained no lasting relief.

Both parents were living, the father being 56 and the mother 50 years of age. The patient was an only child and, as the result of his persistent illness since the age of 9 months, his parents had been unduly solicitous and had watched his every move. The mother was a highly emotional person, who during the patient's attacks also became ill and between seizures manifested anxiety in anticipation of her son's next attack. The patient had been married six years. His wife was 26, well, and had had no pregnancies.

Physical Findings.—At the time of the first examination the patient was apprehensive and showed concern regarding his illness, especially since he had just returned from an exhaustive study at a diagnostic clinic where no suggestions for relief were made other than an abdominal exploratory operation. Examination of the cranial nerves showed no abnormalities. There was no disturbance of the motor dynamics in the upper and lower limbs. The tendon reflex activity was normal throughout, and pathologic reflexes could not be

Laboratory studies showed essentially normal findings as regards blood cells, chemistry and serologic reaction and urinalysis. Previous x-ray studies of the gastrointestinal tract, gallbladder and urinary tract were negative. The blood pressure was 102 systolic, 68 diastolic; the pulse rate was 76, the weight 139½ pounds (63 Kg.).

In view of the periodicity of the abdominal seizures and the complete absence of any specific etiologic factor as well

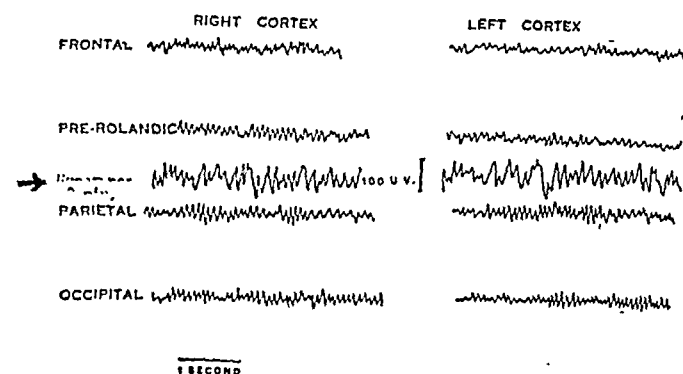


Fig. 1.—Electroencephalogram Dec. 3, 1941, patient receiving anticonvulsant. Note the low voltage three per second abnormal potentials throughout both hemispheres. After hyperventilation, denoted by arrow, an occasional abnormal sharp wave is seen. However, large slow abnormal waves are detected in both frontal lobes.

as his failure to respond to antimigrainous drugs, it was thought advisable to have electroencephalography carried out to determine whether this might be a form of abdominal epilepsy. This was done on June 9 by Dr. Joseph Hughes, who reported that there were low voltage abnormal waves seen particularly in the right and left frontal regions. They were also present, however, in the parietal and occipital lobes. This abnormal activity was increased with hyperventilation. The patient had a cerebral dysrhythmia minimal in degree. About 1 to 2 per cent of individuals might show a response of this degree. Its significance must be estimated clinically (figs. 1 and 2).

Course.—On June 13 medication was started consisting of phenytoin sodium 1½ grains (0.1 Gm.) twice daily and a mild bromide mixture 1 fluid drachm (4 cc.) four times daily. He remained attack free until Jan. 3, 1942, a period of over seven and a half months. On Dec. 5, 1941 I had instructed him to stop medication to learn if the phenytoin sodium was acting as an anticonvulsant or merely by suggestion. The seizure on January 3 was of the usual variety and required morphine sulfate to terminate it. Medication was resumed on the following day, and he remained attack free until July 16, 1942. In order to eliminate the element of suggestion as the effective therapeutic agent in controlling the attacks it was arranged to replace the phenytoin sodium with lactose in the phenytoin capsules without the patient's knowledge. This was done on July 1, 1942 and the seizure occurred fifteen days later. The patient was terribly alarmed, believing the phenytoin was no longer effective, but when told about the experiment he was gratifyingly reassured. His weight had gone from 139½ to 163 pounds (from 60 to 74 Kg.). He has remained attack free during the past fifteen months, during which time he has been receiving phenytoin sodium 1½ grains twice daily. The bromide mixture has been taken irregularly.

COMMENT

The diagnostic problem presented by this patient, after years of intensive study with essentially negative results other than suggestive positive reactions to allergens and abscessed teeth, the latter certainly not a factor since the age of nine months, lay in the consideration of such conditions as an allergic diathesis, abdominal migraine or a conditioned functional disorder of psychogenic origin. The latter offers the objection of stretching psychosomatic concepts beyond credulity in the light of the age at onset of symptoms and the subsequent history. The possibility of an allergic background

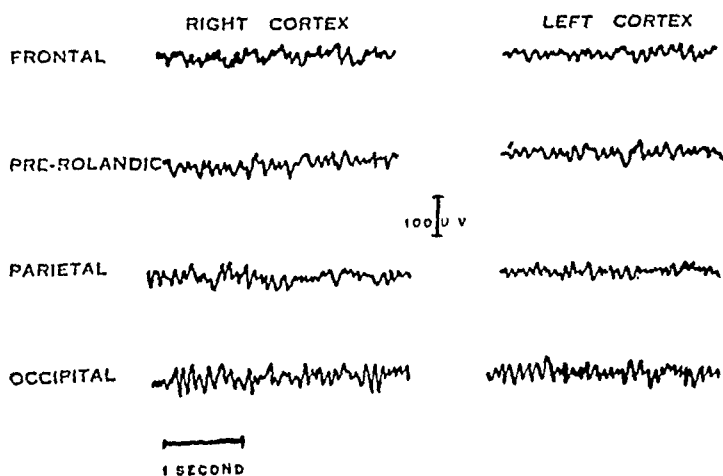


Fig. 1.—Electroencephalogram June 9, 1941, before taking medication. Note the low voltage three per second abnormal waves particularly in the right and left frontal cortex. They are present to a lesser extent in the parietal and occipital areas. This abnormal activity was increased with hyperventilation.

brought out. Coordination was not impaired, and there was no disturbance of cerebellar function. Sensation was intact throughout the body in all modalities. The Romberg maneuver was normally carried out, and the station and gait were normal. Meningeal signs could not be elicited. The examination of the chest and abdomen failed to show any evidence of visceral defects.

warranted real consideration because of his urticarial reaction to injected serum and the ingestion of water-melon. Dietary regimens failed to prevent seizures, however. Abdominal migraine usually is associated with or alternates with other migrainous phenomena such as hemicrania preceding or following the attack of abdominal pain, visual disturbances, nausea, vomiting and diarrhea. None of these occurred in this patient. Moreover the use of ergotamine tartrate was ineffectual, although this cannot be considered conclusive evidence against the diagnosis of a migrainous state. These three conditions had been considered prior to this study, and the objections offered here led to the examination of a more likely diagnosis.

The sudden explosive onset of the abdominal pain at irregular periods over twenty-nine years and the sameness of the pattern suggested a form of focal symptomatic epilepsy. It will be noted in the history that the first attack came on after a siege of diphtheria and the use of diphtheria antitoxin at that time. His severe reaction later in life to an injection of antitetanus serum with urticaria and the usual attack of abdominal pain would warrant the conjecture that he had had cerebral angioneurotic edema with injury or sensitization of the brain following the use of diphtheria antitoxin at 9 months of age. This has been shown experimentally by Dechaume and Croizat,² who produced serum shock in animals and found congestive, hemorrhagic and degenerative changes in the brain. Bassoe³ reported a case in which a woman developed aphasia, hemiplegia, hemianopsia and convulsive seizures following the injection of serum. An exploratory craniotomy, performed because brain abscess was suspected, revealed dark, hyperemic and soft brain tissue in the explored area. The latter was considered due to a focal angioneurotic edema.

The electroencephalographic findings shown in figure 1 of low amplitude three per second waves especially in both frontal lobes and to a lesser extent in the parietal and occipital lobes is suggestive evidence, in an adult, of an underlying disturbed cortex. Considerable experimental and clinical evidence now exists—Bechterew,⁴ Watts and Fulton,⁵ Spiegel, Weston and Oppenheimer,⁶ Penfield and Erickson⁷—indicating that frontal lobe lesions may produce disturbances of motility of the gastrointestinal tract. Fulton states that "the gastrointestinal aura, which occurs in cases of localized epilepsy, coincides with vigorous and abnormal gastrointestinal movements; they are initiated focally in the cortex by the irritating agent responsible for the subsequent epileptic seizure." There is still some question regarding cortical localization of gastrointestinal representation. Fulton and his co-workers⁸ believe that the

premotor area (area 6 of Brodmann) is chiefly concerned in influencing gastrointestinal activity but that areas 3 and 5 also exert some influence on the bowel. Spiegel⁶ demonstrated that "in acute experiments on dogs the gastrointestinal tract could be influenced not only from premotor area 6 but also from foci in a postmotor region (areas 5 or 3 respectively)." It is interesting, as shown in figure 2, that the electroencephalographic tracings, with the patient under medication, during hyperpnea revealed slow abnormal waves confined to the frontal lobes.

Lambert⁹ reviewed the records of over 200 children who presented the chief complaint of abdominal pain and "revealed that in a fourth of them there were no concomitant signs or symptoms of organic disease"; 3 of the children with a history of convulsions showed "marked paroxysmal dysrhythmias in keeping with the clinical diagnosis of convulsive disorder" in the electroencephalograms. Petit mal patterns were seen in the electroencephalograms of two other children, and seven other electroencephalograms showed some degree of dysrhythmia. Klingman and his associates¹⁰ studied 12 children, 3 to 12 years of age, who had unexplained attacks of paroxysmal abdominal pain. Nine of these children showed at some time the additional manifestations of the convulsive state. In all, the electroencephalographic findings were suggestive of cerebral dysrhythmia, mostly of the "psychomotor equivalent" pattern, and on hyperventilation the abnormalities were decidedly increased. These investigators believed that these abnormal patterns "were beyond what might be reasonably expected in younger children."

The satisfactory response to anticonvulsant medication in the case presented here, and the return of seizures following withdrawal of phenytoin sodium, are empirical evidence of the nature of the disorder. The restoration of alpha activity throughout the cortex under anticonvulsant therapy as shown in the electroencephalograms (fig. 2) except under conditions of hyperventilation, when delta activity can be seen, is graphic representation that a direct relationship exists in this patient between the occurrence of abnormal cerebral electrical patterns and the attacks of paroxysmal abdominal pain.

SUMMARY

A man aged 32 had irregular attacks of isolated paroxysmal abdominal pain over a period of twenty-nine years which began at the age of 9 months. Electroencephalographic studies revealed abnormal slow waves particularly over both frontal lobes. Anticonvulsant therapy (phenytoin sodium and bromides) brought about a cessation of the seizures and restored the alpha activity to the electroencephalographic tracings. The explanation offered as to the possible etiologic basis for the localized epileptic disturbance, expressed by abdominal pain, is that the cerebral cortex, especially the frontal lobes, was injured or sensitized by the injection of serum when the patient was 9 months of age, producing a cerebral angioneurotic edema, and the altered brain tissue becoming the seat of abnormal electrical discharges.

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ABILITY OF DIFFERENT TYPES OF HEMOLYTIC STREPTOCOCCI TO PRODUCE SCARLET FEVER

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Whether certain strains of hemolytic streptococci are more likely to produce scarlet fever than others has been debated for many years. Since the development of methods for the serologic separation of the hemolytic streptococci, the following facts bearing on the problem have been established:

(a) All the known Griffith types¹ have been reported to have produced scarlet fever at one time or another.²

(b) Keogh and his co-workers³ in Melbourne found that type 6 apparently failed to produce scarlatiniform rashes in children, though it was capable of producing enough antitoxic immunity in some children to prevent their developing rashes when they were later infected with a known rash producing type.

(c) Neisser⁴ has reported that Griffith type 25 failed to produce scarlet fever in Dick positive persons and stated that this type rarely produces scarlet fever.

(d) In a study of strains of hemolytic streptococci from various sources, Keefer, Rantz, Shuman and Rammelkamp⁵ found suggestive evidence that certain types, e. g. 13, were more likely to produce scarlet fever than other types.

(e) Certain strains of hemolytic streptococci produce soluble erythrogenic (Dick) toxin while others do not.⁶

In order to demonstrate the relative ability of different strains to produce scarlet fever, the ratio of cases of pharyngitis-tonsillitis with and without rash should be determined in a community where access to a high proportion of all the infected persons is possible. Since most patients with streptococcal pharyngitis-tonsillitis without rash are not ordinarily hospitalized and therefore not identified as to serologic type, the opportunity to make such a study presents itself but rarely. It is our purpose in this report to present the results of typings of 672 strains of group A streptococci from patients in an army post where most of the infected persons were hospitalized. These studies show clearly that in a homogeneous community the proportion of

infected patients who develop a scarlatiniform rash is quite different for different serologic types of hemolytic streptococci.

SOURCE OF THE STREPTOCOCCI

The strains herein reported were recovered from the throats of patients with streptococcal pharyngitis, with or without scarlet fever, admitted to a station hospital. During the winter and spring of 1943 it was the practice in this hospital to separate, as far as possible, patients suffering from streptococcal sore throats from those with other upper respiratory diseases. In general, throat cultures were made on all patients who had tonsillitis, those whose throats were fiery red and any others who the ward or admitting officers believed might be infected with hemolytic streptococci. Consequently it was possible to secure cultures from a large sample of the streptococcal disease prevalent in the camp, though of course not all the cases in the camp are represented. Because of the dramatic nature of the rash, it is probable that over 90 per cent of the cases of scarlet fever are included.

The patients were all men between the ages of 18 and 40. All had had their basic training and were being given advanced courses in various specialties. Their length of residence on the post varied from three weeks to about three months.

One throat culture was taken on most patients, and one colony picked for grouping and typing. In many cases more than one throat culture was made, and in some six or seven separate colonies were typed. In no instance was more than one type recovered from any individual.

Dick tests were not done, but Schultz-Charlton tests performed by Capt. George B. Emory, contagious disease control officer, were positive in over 95 per cent of the cases of scarlet fever.

SEROLOGIC IDENTIFICATION OF THE STREPTOCOCCI

Some strains were grouped and typed immediately after isolation. Most, however, were stored in the ice box in small tubes of mule blood broth covered with a layer of liquid petrolatum and typed one to five months later. These stock cultures were transferred once during the period of storage.

When the cultures were removed from stock they were transferred first to blood broth and then subcultured in 40 cc. of tryptose phosphate broth. Hydrochloric acid extracts of the sedimented organisms were made and all group A strains typed by the capillary precipitin method of Swift, Wilson and Lancefield.⁷ This method, which distinguishes hemolytic streptococci according to their M substance,⁸ is particularly useful in typing large numbers of strains because granularity of the culture presents no problem, cross reactions are rare and as soon as the common types in a community have been identified the extracts of the organisms need be set up only against the serums of these types.⁹ Thus it was our practice to set up unknown extracts against types 1, 3, 6, 17 and 19. If the extract proved to be one of these types, the type was recorded and the extract discarded. If no precipitate formed with these serums, the remaining extract was placed in the ice box and set up the following

Dr. O. H. Robertson, director of the Commission on Air-Borne Infections, gave continued encouragement and helpful criticism.

From the Commission on Air-Borne Infections, Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the United States Army, Preventive Medicine Service, Office of the Surgeon General, U. S. Army.

Helpful cooperation was given by the medical officers at the camp, without whose good will and assistance these studies would have been impossible. The officers most closely associated with the work were Col. Dan S. Ogle, Col. Irwin B. March, Col. Arthur H. Corliss, Lieut. Col. Vincent Lentini, Major John S. Moffatt, Major H. D. Countryman, Major Forrest E. Martin, Capt. George B. Emory and Capt. E. Paul Tischer.

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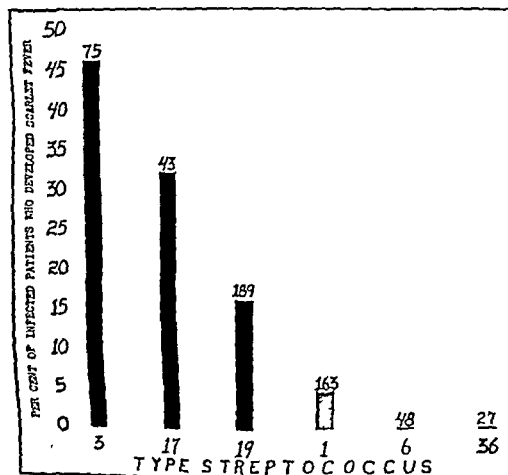
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day against serums of types 5, 18, 29 and 36. If these were also negative, the extract was then tested against types 2, 4, 8, 9, 11, 12, 13, 14, 15, 22, 23, 24, 25, 26, 28, 30, 31, 32, 33, 34, 37, 38, 39, 40, 41, 42, 43, 44 and 46, all the serums that were available. Most strains which failed to type at this stage were then recorded as "negative." In some instances 1:2, and occasionally 1:4 dilutions of the extract were made and the typing repeated; this procedure occasionally resulted in a positive typing. Also a few type 19 strains which gave no precipitate with undiluted serum yielded positive reactions when the serum was diluted 1:2.

Though the main part of this report concerns the differences in the incidence of scarlet fever among patients infected by different types of hemolytic streptococci from November 1942 to August 1943, the results of typings made during the spring of 1942 are appended for a comparison of the general type incidence during the two seasons. Since no attempt was made to secure cultures from all the patients with scarlet fever during the spring of 1942, these data are of no value in determining the relative rash producing capacities of various strains. Many of these cultures were



Percentage of scarlet fever developing among patients infected with various types of hemolytic streptococcus. Numbers at tops of columns represent total number of patients infected with that type hemolytic streptococcus, both scarlet fever and pharyngitis-tonsillitis without rash.

typed by the slide agglutination method,¹⁰ and those which showed cross reactions or which failed to type were later checked by the capillary precipitin method.

RESULTS

Occurrence of Scarlet Fever Among Patients Infected with Different Serologic Strains of Hemolytic Streptococci, November 1942 to August 1943.—Among the types represented by significant numbers of cases, the proportion developing scarlatiniform rashes varied from 46.6 per cent due to type 3 to none due to types 6 and 36 (table 1 and the chart). Intermediate between these two extremes were type 1 with 4.3 per cent, type 19 with 16.5 per cent and type 17 with 32.5 per cent. No scarlet fever appeared among the 17 patients infected with type 18, though the previous year this type caused several cases. The other types included in table 1 were not present in sufficiently large numbers to warrant the drawing of conclusions.

10. Agglutinating serum for the slide agglutination test was supplied by the Commission on Hemolytic Streptococci. Two sets of serum were used, one prepared by the Lederle Laboratories, Griffith,¹ Schwenker,²

Comparison of Type Incidence in Two Successive Years.—Though the population of the camp was continually changing, the type incidence of group A streptococci for the period November 1942 to August 1943 was very similar to that of the spring of 1942 (table 2). In both years types 19, 1, 6 and 17 were among the

TABLE 1.—Proportion of Cases of Scarlet Fever Among Total Cases of Streptococcic Pharyngitis-Tonsillitis Produced by Serologically Separate Hemolytic Streptococci

Group A Type	November 1942 to August 1943 Total Streptococcic Pharyngitis- Tonsillitis		Percentage of Scarlet Fever Patients in Each Type
	Patients With and Without Rash	Number of Patients With Scarlet Fever	
19	189	31	16.5
1	163	7	4.3
3	75	24	46.6
6	48	0	0
17	43	14	32.5
36	27	0	0
18	17	0	0
5	16	0	0
12	9	0	0
29	6	4	66.7
30	4	0	0
28	3	0	0
15	2	0	0
14	2	0	0
39	1	0	0
24	1	0	0
Type undetermined	63	5	7.6
Total group A	672		
Total scarlet fever		95	
Per cent scarlet fever of all cases			14.1

five commonest types found, and in both years these types followed one another in frequency. The commonest type in the spring of 1942, type 18, fell to seventh place the following year, but two new types appeared in significant numbers. These were types 3 and 36.

TABLE 2.—Type Incidence of Group A Hemolytic Streptococci Among Cases of Pharyngitis-Tonsillitis in Two Successive Seasons

March to June 1942		November 1942 to August 1943	
Type	Percentage of Total Cases Infected by Each Type	Type	Percentage of Total Cases Infected by Each Type
18.....	29.4	19.....	28.2
19.....	24.4	1.....	24.1
1.....	11.7	3.....	11.2
6.....	10.0	6.....	7.1
17.....	6.7	17.....	6.9
26.....	3.3	36.....	4.0
12, 39.....	2.8 each	18.....	2.5
2, 9.....	2.5 each	5.....	2.4
10, 11, 15, 25, 28, 43, 45	Less than 1% each	12.....	1.3
Undetermined.....	3.3	14, 15, 24, 28, 29, 30....	Less than 1% each
Total number of patients, 180		Undetermined.....	9.8
		Total number of patients, 672	

From November 1942 to August 1943 the data include over 95 per cent of the cases of scarlet fever plus about 80 per cent of cases of streptococcic pharyngitis-tonsillitis without rash.

During the spring of 1942 very few of the scarlet fever cases were cultured.

COMMENT

The establishment of the relative ability of various strains of hemolytic streptococci to produce scarlet fever is of considerable epidemiologic importance. Scarlet fever is a reportable disease in practically all communities, whereas other forms of streptococcic disease are not. If the ratio of cases of scarlet fever to the total cases of streptococcic pharyngitis-tonsillitis can be established for the various serologic types, a yardstick will be available for the estimation of the total amount

of streptococcic disease in a community during a given season. The information provided by such estimations would be of great value in the study of the epidemiology of rheumatic fever and other conditions associated with the hemolytic streptococcus.

Moreover, it would appear that serologically different strains may actually differ in their biologic behavior. If it is true that certain types are more likely to cause scarlet fever than others, it is also possible that specific strains may be found associated with such conditions as rheumatic fever and glomerulonephritis. The answer to these speculations will be forthcoming only when much larger groups have been studied.

If the population from which the strains herein reported was homogeneous in respect to susceptibility to scarlet fever, there can be little doubt that hemolytic streptococci types 3 and 17 are more likely to produce the disease than are types 1 and 19, and that types 6 and 36 would produce it but rarely. No Dick tests were performed to test the antitoxic immunity among the men in the camp. However, since nearly all were in the age group 18-35, and since they were drawn from all parts of the United States rather than from special areas, it is likely that the proportion of susceptible men infected by the various types was about the same. It is extremely unlikely that type 3 should have picked out persons with no antitoxic immunity, while types 1, 6 and 36 should have avoided these individuals. If this assumption is correct, it must be concluded that some strains of hemolytic streptococci have more highly developed rash-producing properties than others.

Though the data in this paper are probably significant in respect to the strains present in the camp, it will be interesting to see whether similar experiences with other homogeneous groups will corroborate these results. It is not inconceivable that differences in their capacity to produce scarlatiniform rashes exist among strains of the same serologic type.

The similarity in the type incidence in the camp during two successive years was surprising and suggests either that types 19, 1, 6 and 17 are very common in the entire army or perhaps in the United States as a whole or that these strains remained quiescent in the camp during the summer and the fall and became active again the following winter. Though the population of the camp was rapidly changing during the eighteen months of the study, these four types comprised 52.8 per cent of the total one year and 66.6 per cent the next. For some inapparent reason type 18, which was the commonest single type during the spring of 1942, was found in only 2.5 per cent of the cases the following fall, winter and spring. That only two important new types, types 3 and 36, should have invaded the post when thousands of new men from all parts of the country were continually passing through was not expected.

SUMMARY

1. A study of the incidence of serologic types among 672 strains of hemolytic streptococci was made in an army camp where the majority of patients with pharyngitis-tonsillitis were hospitalized, regardless of whether they had scarlatiniform rashes or not.

2. Of those types present in statistically significant numbers, type 3 produced scarlet fever in 46.6 per cent of the patients it infected and type 17 in 32.5 per cent. Type 19, on the other hand, produced scarlet

fever in only 16.5 per cent of the cases, and type 1 in only 4.3 per cent. Types 6 and 36 produced no cases of scarlet fever.

3. Despite the constantly changing population of the camp, types 19, 1, 6 and 17 were among the five most common during two successive years. Type 18 was the commonest type during the spring of 1942 but fell to seventh place the following year. Types 3 and 36 appeared in the camp during the winter of 1943, though they had not been present the preceding year.

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Clinical Notes, Suggestions and New Instruments

A CASE OF PROBABLE INTRACRANIAL ANEURYSM ASSOCIATED WITH THE SYNDROME OF HISTAMINIC CEPHALGIA

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Three interesting and important types of headache are those of histaminic cephalgia, of expanding intracranial aneurysm and of classic migraine, the last mentioned being associated occasionally with ophthalmoplegia. Histaminic cephalgia, clearly defined as a disease syndrome by Horton,¹ has these salient features: It is a brief, recurrent, violent, unilateral headache involving the temple, the eye and the neck. Usually nocturnal in onset, it is associated with congestion of the nostril and eye on the affected side, and there is profuse watering of the eye. Pressure over the swollen temporal arteries or over the common carotid artery will give transient relief. The syndrome may be precipitated by alcohol or by histamine, may be relieved in the individual attack by epinephrine, and may be permanently relieved by desensitization with histamine. The second type of headache, brought about by expanding intracranial aneurysm, may give rise to varied headaches. However, Dandy² has described 13 cases in which intense headache involved the side of the head and the homolateral eye and was associated with paresis or palsy of the oculomotor nerve. The responsible aneurysms arose from the internal carotid artery on the affected side, either in the carotid canal or intracranially before the anterior cerebral artery is given off. Walsh and King³ have discussed the occurrence of severe, intermittent pain in or about the eye in association with aneurysms of the anterior end of the circle of Willis. After days or weeks of this intermittent pain, paralysis of the oculomotor nerve may occur. The third syndrome, that of ophthalmoplegic migraine, is well described by Oppenheim⁴ and Wilson.⁵ In persons having classic migraine, paralysis of the oculomotor nerve, and rarely also of the trochlear and abducens, may occur. The paralysis may last from a few days to several weeks, resulting in complete recovery, only to recur with the next attack of migraine. In many cases there is finally permanent paralysis of the oculomotor nerve. The onset of ophthalmoplegia may coincide with that of the headache, may occur late in the attack and presage cessation of the hemicrania, or the periodic ophthalmoplegia may occur without headache. Oppenheim⁴ stated that "periodic oculomotor paralysis is related to hemicrania and, as presumably the latter, is to be ascribed to vasomotor processes." He believed that transient ischemia of the nerve, or pressure on it by engorged blood vessels, gave rise to the

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paralysis, but that no local lesion of the nerve or blood vessels existed in these cases. Oppenheim observed however that, in contrast to the typical attack of migraine, the headache and vomiting might exist over a period of weeks when associated with oculomotor paralysis. This observation would suggest confusion with the syndrome of intracranial aneurysm. Wilson,⁵ writing later than Oppenheim, did not consider the cause of the ophthalmoplegia to be identical with that of the reversible migraine, regardless of their association. He found at autopsy various neoplastic or inflammatory changes of or adjacent to the third nerve. Bassoe,⁶ in his discussion of migraine, chooses to exclude cases with an associated ophthalmoplegia. He considers the probability of organic vascular disease to be great in such cases. The following case is of interest, as it contains the salient features of the three syndromes of histaminic cephalgia, of aneurysm of the internal carotid artery and of ophthalmoplegic migraine.

REPORT OF CASE

An intelligent, Swedish born, married woman of 57 had always been well except for severe rightsided headaches accompanied by nausea and vomiting. These headaches had occurred throughout the menacme, usually only at the time of her menses. No headaches of any type had been present since the menopause nine years prior to the present illness. At that time she sought advice concerning a throbbing, rightsided headache of daily occurrence for several weeks, which was variable in duration, time of onset and intensity and bore no similarity to the headaches which formerly had existed during the menacme.

Physical examination of this slender, alert, rather tired woman gave normal results. The retinas showed but slight arteriovenous compression, and the blood pressure was 130/80. Neurologic examination was normal, as were the Kahn reaction and the routine blood counts and urinalysis. At that time no opinion was formed as to the nature of her headache.

Several days later the patient was seen at home, having had for an hour an excruciating rightsided headache. Restless, moaning and in agony, she was reluctant to remove her hand from the right eye, of which the lids were swollen, the conjunctiva was deeply injected, and from which the tears flowed constantly. The right temporal vessels were prominent and tender. Pain and exquisite tenderness involved also the eye, the side of the nose at the level of the inner canthus, the entire temporal region and the nuchal muscles of the right side. The left side of head and the neck were uninvolved. The pain and spasm of the nuchal muscles were such that the patient could not rotate her head. Compression of the right carotid artery gave relief from the headache within a few seconds. Within a minute the eyelids were less swollen and the patient could open her eye. The tears ceased, the conjunctiva became less suffused, and relaxation of the nuchal muscles allowed painless rotation of the head. Upon release of the pressure over the carotid, the patient cried out with pain and the former condition returned immediately in all detail. She was given epinephrine 0.5 cc. of 1:1,000 solution subcutaneously. Within five minutes the cervical myalgia, the hemicrania, the tumescence of the temporal vessels and the lacrimation, photophobia and conjunctival suffusion of the right eye all became mild. After a second injection of 0.5 cc. of epinephrine, as the pulse rose and the skin became cool and damp, the patient fell into a sound sleep. The headache recurred within several hours, and she was hospitalized.

Physical, neurologic and routine blood and urine examinations again gave normal results. X-ray examination of the skull gave normal results. Lumbar puncture showed an initial pressure of 70 mm. of cerebrospinal fluid with normal dynamics. The cerebrospinal fluid showed minimal xanthochromia on comparison with water. The protein content was 65 mg. per hundred cubic centimeters, the colloidal gold curve read 0¹⁰, the Wassermann reaction was negative, and 5 lymphocytes per cubic millimeter were present. The xanthochromia, though slight, was considered adequate evidence for relating the headache to intracranial organic disease.

During the first two days the syndrome occurred irregularly and severely, lasting from one half to two hours. The headache was precipitated by 0.05 to 0.1 mg. of histamine subcutaneously, and repeatedly was relieved in full or in part by 1 cc. of 1:1,000 epinephrine. Morphine sulfate subcutaneously in amounts of 0.015 mg. alone or combined with 2 Gm. each of sodium salicylate and sodium bromide by mouth gave unsatisfactory relief. Desensitization by histamine, as recommended by Horton,¹ was initiated. On the third hospital day the right upper lid was paretic; by evening there was complete loss of right oculomotor function, the pupil being dilated and not reacting to light, and only the external rectus and superior oblique muscles retaining their function. On this day there was no headache. Lumbar puncture yielded the same findings as on the day of admission.

From the third to the eleventh days the oculomotor paralysis was constant, the lacrimation of the right eye was only occasional and slight, and the retro-orbital pain was mild. Attacks of temporal pain and nuchal myalgia continued, coming regularly every morning at about 4 o'clock, the patient usually awakening from sound sleep with a cry. Morphine sulfate 0.015 mg. would now give gradual relief. The headache might recur three to four times daily at irregular intervals. Progressive histamine desensitization was continued during this period. For three days 180 units of histaminase ("Torantil") was given daily by mouth with no appreciable effect and was then discontinued. On the eleventh and twelfth days the headaches were mild, and the patient was up and about her room.

On the evening of the twelfth day she suddenly lost consciousness and went into shock with irregular respiration and a pulse rate of 45. Other than stiffness of the neck, no abnormal neurologic signs were present. Lumbar puncture revealed grossly bloody fluid under elevated pressure. Consciousness returned in two hours, there was moderately severe generalized headache, and the deep and superficial reflexes remained normal. From the twelfth to the twentieth day there was fever of from 101 to 102 F. and gradual subsidence of the stiffness of the neck and the generalized headache. Following the hemorrhage, the patient was seen in consultation by Dr. Peter Bassoe, who concurred in the diagnosis of a ruptured aneurysm of the right internal carotid at or near the circle of Willis and advised against an attempt to ligate below or about the aneurysm. From the time of the hemorrhage on the twelfth day until the thirty-second day there was no definite manifestation of the hemicranial syndrome, only the oculomotor paralysis continuing. From the thirty-third to the thirty-eighth day this paralysis began to improve. At the same time that this improvement was noted, the hemicrania recurred mildly in the early morning, and on occasion during the day, and on the thirty-ninth day struck again with full fury. Temporal hemicrania, lacrimation, suffusion of the conjunctiva and pain at the root of the nose and in the eye all returned; the right cervical myalgia did not recur. The attacks came almost only in the early morning, as had previously been the most regular time of occurrence. Histamine desensitization, stopped at the time of the hemorrhage, had not been resumed. Morphine and codeine were palliative. Sleeping with the bed at an angle of 30 to 45 degrees gave no relief. Benefit was satisfactory, but not complete, from the introduction high into the right nostril of applicators soaked with 1:1,000 epinephrine. A capsule of 5 grains (0.32 Gm.) of caffeine citrate often gave complete relief and was more rapidly obtainable than the equally efficacious strong coffee. By the sixty-fourth day the attacks of early morning headache were mild and were easily controlled by caffeine citrate by mouth. Only slight oculomotor paresis was present. The patient was discharged to her home and after another month had no more headaches. When the patient was last seen in July 1942, nine months after discharge from the hospital, she was enjoying excellent health, had had no headache of any type for eight months and only occasionally, when tired, had transient diplopia from a mild paresis of the right internal rectus muscle.

6. Bassoe, Peter: Migraine, *J. A. M. A.* 101:599 (Aug. 19) 1933.

COMMENT

The immediate cause of headache appears to be that of rapid fluctuations of arterial intramural tension.⁷ Horton¹ states that the mechanism of the headache in histaminic cephalgia is not clear but suggests that it is from "a local release of histamine with resultant vasodilatation which is almost exclusively confined to the ramifications of the external carotid artery." Such a "local release of histamine" has been demonstrated in the phenomenon of dermographism. However, histamine has not been shown to be a chemical mediator in the sense of epinephrine and acetylcholine, both of which will cause local vasomotor changes when the corresponding autonomic nerves are stimulated. Our present knowledge hardly justifies any assumption further than the mediation of local arterial and arteriolar changes by the associated vasomotor nerves. Desensitization to histamine may well diminish a general or local tendency to vasodilatation, but that does not indicate that the local vasodilatation is caused by histamine. The objective manifestations of histaminic cephalgia, comprising local vasodilatation, increased skin temperature, hyperemia of the conjunctiva, lacrimation and often rhinorrhea, are principally evidences of cervical sympathetic paralysis, partially of parasympathetic stimulation. Paroxysmal vasodilatation because of local sympathetic disturbance either in the hypothalamus or peripherally in the periarterial plexes could well give rise to this localized syndrome. Local disease of the carotid artery, as in the case presented, might constitute such a disturbance of the surrounding plexus. The relaxed vascular tonus during sleep (and in the horizontal position) lowers the threshold to crises of local vasodilatation, just as alcohol and histamine can precipitate such a crisis. I took care of a middle aged man who began to have severe hemiparesis after drinking his customary eight highballs, slowly had to reduce the highballs as the headaches were progressively more easily precipitated, and, when finally one highball would cause severe headache, died of recurrent subarachnoid hemorrhage. It is difficult to explain localized, dynamic, vascular changes otherwise than by a disturbance of innervation. It is reasonable to consider that there is a disturbance of vasomotor control which renders that subordinate portion of the arterial system peculiarly susceptible to vasodilator influences.

Horton has stated⁸ that there was no evidence of organic disease precipitating the syndrome of histaminic cephalgia in the series of cases which he studied. The same may be said for most cases of epilepsy, classic migraine, Ménière's syndrome, bronchial asthma and peptic ulcer. Precipitating and aggravating factors in many of these diseases are recognized; the fundamental causes remain unknown. The origin of such disturbances may well be in the hypothalamus, that mysterious region in which the terms "organic" and "functional" become pale, confused and devoid of meaning.

The resemblance of this case to the syndrome of ophthalmoplegic migraine is superficial. The patient had had classic migraine during the menacme, and she recognized the later headache as being different. However, if it had not been for Horton's description of histaminic cephalgia, and for the lumbar puncture which showed minimal xanthochromia, a diagnosis of ophthalmoplegic migraine would have been entertained. In this case, relief from the headache came only partially with the ophthalmoplegia, completely with the hemorrhage, and recurred for a few weeks during final convalescence.

SUMMARY

A woman of 57, who had had classic migraine during the menacme, had no headache for nine years following the menopause and then suffered the acute onset of severe, paroxysmal headache. The latter headache, in all essential features, conformed to the description by Horton of the syndrome of histaminic cephalgia. The course of the illness in this case indicates that the disease giving rise to the syndrome was that of an aneurysm of the right internal carotid artery.

7. Schumacher, G. A., and Wolff, H. G.: *Experimental Studies on Headache*, Arch. Neurol. & Psychiat. 45: 199 (Feb.) 1941.
8. Horton, B. T.: Personal communication to the author.

ACUTE GOITER DUE TO CYANATE THERAPY

REPORT OF TWO CASES WITH THYROIDECTOMY

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Since 1925, when the various cyanate preparations were reintroduced in the treatment of essential hypertension, various toxic manifestations have been noted in patients receiving these drugs, including a sudden and often painful enlargement of the thyroid gland. This acute goiter fluctuates in size and is often so painful that it has been considered actual thyroiditis. Symptoms suggesting myxedema may accompany the enlargement of the thyroid, such as edema of the eyelids. The basal metabolic rate is often normal or minus. Regression in the size of the gland to normal occurs with cessation of the cyanate therapy. The most recent published case is that of Foulger and Rose,¹ who report that a woman aged 35, who was given potassium thiocyanate for essential hypertension, showed symptoms of myxedema, the thyroid gland became noticeably enlarged and the basal metabolic rate was slightly below normal. Regression occurred following the administration of thyroid and cessation of the cyanate therapy. Fahlund² reported that a woman aged 61, who had had a thyroidectomy done eleven years previously, developed an extremely tender enlargement of the thyroid gland in addition to a diffuse maculopapular eruption over the face, extremities and trunk. The diagnosis was made of acute thyroiditis and dermatitis medicamentosa, all thought due to sensitivity to potassium thiocyanate. The cyanate therapy was discontinued and the painful thyroid rapidly regressed in size, so that it was no longer palpable five days later.

I have recently had the opportunity of examining 2 specimens of cyanate goiter, grossly and microscopically, which had been removed from 2 patients in two different hospitals. In both cases there had been a rather sudden and rapid enlargement of the thyroid gland. In 1 instance the enlargement was suspected of being due to a carcinoma, and in the other case the acute swelling was ascribed by the clinician in charge of the patient as being due to hemorrhage into an adenoma. In neither case, however, was there any record of a preexisting adenoma of the thyroid having been observed.

The only other reported microscopic study of a cyanate goiter is that of a case of Means³ in which a biopsy was made of a patient who was receiving cyanate therapy and who developed a sudden enlargement of the thyroid gland. However, the microscopic report is inconclusive in this case. The following 2 cases are reported, therefore, with a brief discussion of the microscopic appearance, since it is my opinion that this is not a new pathologic entity but is one that has frequently been incorrectly diagnosed or the true nature of the microscopic picture misinterpreted.

REPORT OF CASES

CASE 1.—A white woman aged 67, a housewife, had been treated at a private physician's office since April 1942 for hypertension. Her blood pressure ranged between 260/140 and 190/90. Beginning on May 5, 1942 potassium thiocyanate was given the patient in doses averaging 20 grains (1.3 Gm.) daily. Her blood cyanate level varied from 12 to 20 mg. per hundred cubic centimeters. Enlargement of the thyroid gland was first noticed on Dec. 15, 1942, approximately seven months following the first administration of the potassium thiocyanate. There was some fluctuation in the size of the thyroid gland, but eventually the patient complained of difficulty in swallowing and developed edema of the eyelids and the face. It was at this time that her physician suspected carcinoma arising in the thyroid and sent her to the King County Hospital for a thyroidectomy. The patient was first seen in the King County Hospital on Feb. 5, 1943 with a chief complaint of difficulty in

From the Department of Pathology, Mason Clinic, and the Department of Pathology, King County Hospital.

1. Foulger, Margaret P. H., and Rose, Edward: *Acute Goiter During Thiocyanate Therapy for Hypertension*, J. A. M. A. 122: 1072 (Aug. 14) 1943.

2. Fahlund, G. T. R.: *Painful Enlargement of the Thyroid Gland: A Manifestation of Sensitivity to Thiocyanate*, Proc. Staff Meet., Mayo Clin. 17: 289 (May 13) 1942.

3. Means, J. H.: *Diseases of the Thyroid Gland*, New England J. Med. 227: 594 (Oct. 15) 1942.

swallowing and swelling of the eyelids. Physical examination showed edema of the eyelids and a portion of the upper part of the face. The thyroid was diffusely enlarged. It was smooth and was slightly tender to palpation when the head was turned from side to side. There was no thrill or bruit. There was cardiac enlargement, due presumably to the patient's hypertension, the blood pressure on admission being 200/95. The basal metabolic rate soon after admission was -5 . This was repeated in a few days and was $+21$. Thyroidectomy was decided on and the patient was given 10 minims (0.6 cc.) of strong solution of iodine (Lugol's solution) three times daily for approximately two weeks. Subtotal thyroidectomy was done on March 2.

Pathologic examination revealed that the specimen consisted of two lobes of thyroid gland connected by an isthmus, weighing 52 Gm. The surface was relatively smooth and somewhat lobular, but no discrete nodules were found. The surface made by cutting had a meaty appearance. The gland was firm, was pink, and resembled the appearance of a hyperplastic thyroid. Microscopic sections (fig. 1) showed a solid cellular pattern, the acini were uniformly small, the epithelium was cuboidal to columnar, and the colloid was either very scanty or entirely absent. However, what colloid was present stained brilliantly as though it were concentrated. Some acini were imperfectly formed, and there were areas where these cells appeared to be arranged in a cordlike pattern. There was some lymphocytic infiltration, although there was complete absence of lymphoid follicles.

CASE 2.—A white woman aged 25, a housewife, was first seen at the Mason Clinic on June 23, 1942 with a chief complaint of high blood pressure. This had been present for many years, having first been noticed when the patient was 12 years of age, when the blood pressure was 160, and again at the age of 19, when an examination showed the blood pressure to be 170. She had had no subjective symptoms from her hypertension until recently, when she had noticed persistent fatigue and some difficulty with her vision. The patient was obese, with a height of 66 inches (168 cm.) and weight of 210 pounds

on a reduction diet and on June 27 was placed on potassium thiocyanate, the average dose being $7\frac{1}{2}$ grains (0.5 Gm.) daily. For the next four months the patient was given cyanate therapy, and the blood cyanate level varied between 5 and 14.8 mg. per hundred cubic centimeters. On October 8 a therapeutic abortion was done on a gravid uterus of six weeks'

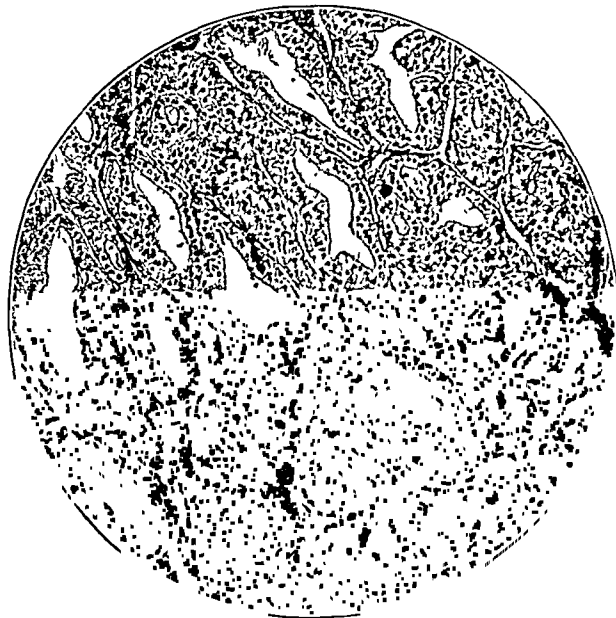


Fig. 2 (case 2).—The acini are irregular in shape and they are devoid of colloid. Many acini are imperfectly formed and the cordlike pattern is demonstrated. Masson trichrome; reduced from a photomicrograph with a magnification of 129 diameters.

duration. On November 3 enlargement of the thyroid gland was first noticed, approximately four months after the patient was started on cyanate therapy. This was a smooth enlargement, more pronounced on the right side, and was slightly painful. The patient was observed at intervals for the next few months, during which time fluctuation in the size of the thyroid gland was noticed. On July 17, 1943 the right lobe of the thyroid had become noticeably enlarged compared with previous examinations, and it was felt at that time that the patient had a hemorrhage into an adenoma of the thyroid. The basal metabolic rate done on two machines at this time was -30 and -31 . The patient was given strong solution of iodine 10 minims (0.6 cc.) three times a day for one day, and a subtotal thyroidectomy was done on August 3.

Pathologic examination revealed that the specimen consisted of several pieces of thyroid gland weighing 42 Gm. The surface was slightly lobular; the surface made by cutting was firm and pink and was meaty in appearance. The consistency of the gland was uniform throughout. There was no evidence of an adenoma nor any evidence of hemorrhage. Microscopic sections (fig. 2) showed acini which were uniformly small and which contained little or no colloid. The epithelium was high, cuboidal or columnar. The nuclei were large, and the cytoplasm was vacuolated. Many of these acini were imperfectly formed, and these contained no colloid whatever. There was considerable interlacing of coarse fibrous connective tissue between these acini.

COMMENT

Viewing the subject objectively, as a pathologist, one is impressed with extreme parenchymatous hypertrophy and hyperplasia. The microscopic appearance, however, is not that of toxic diffuse goiter, although there is a vague similarity to the microscopic appearance which was seen in toxic diffuse goiter before iodine was used as a preoperative medication. One difference is that the acini in the cases under discussion do not have the papillary infolding of epithelium into the acini which is seen in the hyperplasia of toxic diffuse goiter. What colloid is present is not thin or poorly stained, but rather it stains brilliantly as though concentration had occurred. The vacuolation of the colloid immediately adjacent to the epithelium



Fig. 1 (case 1).—The small acini with tall epithelium are shown. Colloid is entirely absent in some acini; where it is present, the staining is brilliant. Masson trichrome; reduced from a photomicrograph with a magnification of 129 diameters.

(96 Kg.). Funduscopy showed hypertensive retinitis group 2 to 3. The remainder of the physical examination was essentially negative, except for the blood pressure, which was 220/140, and the pulse rate was 120. Complete laboratory studies were made; which were all negative except for a fixed specific gravity of the urine after the concentration test. A diagnosis was made of severe hypertension. The patient was put

so commonly seen in toxic diffuse goiter is absent. Another point of difference between the cyanate goiter and the toxic diffuse goiter is the absence of lymphoid follicles, which are often, although not always, seen in toxic diffuse goiter. The extreme irregularity of the acini in some areas and a tendency toward invasiveness suggest a neoplasm, although in neither case was an adenoma present, which in most cases is a prerequisite etiologic factor in carcinoma of the thyroid. The veins show no tumor cells.

When the pathologist, because of the bizarre microscopic appearance presented in these 2 cases, obtains the clinical history, including the basal metabolic rate, it is apparent that there is a definite discrepancy between the clinical aspects and the microscopic picture. Neither case presented any evidence of hyperthyroidism; both showed mild clinical evidence of hypothyroidism, including a normal or a minus basal metabolic rate. Because of uncertainty and confusion which existed in my mind, microscopic sections in case 2 were sent to pathologists of two universities and also to a pathologist associated with a clinic group. A brief summary of the clinical history also was sent, including the basal metabolic rate, but there was no mention made of cyanate therapy, which at the time seemed unimportant. Three divergent diagnoses were received: One university pathologist stated that this was a Hürthle cell tumor and classified it as a malignant neoplasm. The diagnosis of the other university professor was "a special type of hypothyroidism closely related to sporadic cretinism." The pathologist of the clinic group, who had (I have learned subsequently) recently seen a similar slide with a similar history, gave the correct diagnosis.

A MUTED MEGAPHONE FOR THE FITTING OF HEARING AIDS

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Conversational and whispered voice tests for the determination of hearing impairment, though widely used, are admittedly seriously inaccurate. When such tests are used in the fitting of hearing aids the inaccuracy becomes an even greater problem, since the patient is purchasing an expensive piece of electrical equipment on the basis of these findings. Changing the intensity of one's voice such as whispering is practically impossible to control accurately, and the natural reaction when walking away from a listener is unconsciously to raise one's voice. However, every person maintains a relatively constant loudness for direct conversational speech.

On the basis of this fact the muted megaphone, a detailed drawing of which is appended, is presented as a reasonably accurate method for determining a patient's hearing impairment and the overall gain in speech reception derived from the use of any given hearing aid.

By careful and accurate acoustic measurement it has been found that at a distance 6 feet from the speaker normal conversational voice is amplified 20 decibels by the use of a 2 foot megaphone. If the megaphone is damped or "muted" by the placement of specially designed felt disks, the voice is attenuated or reduced from 10 to 15 decibels for each disk. With four disks in place the voice is attenuated to a level at which only the normal hearing person can understand the spoken words.

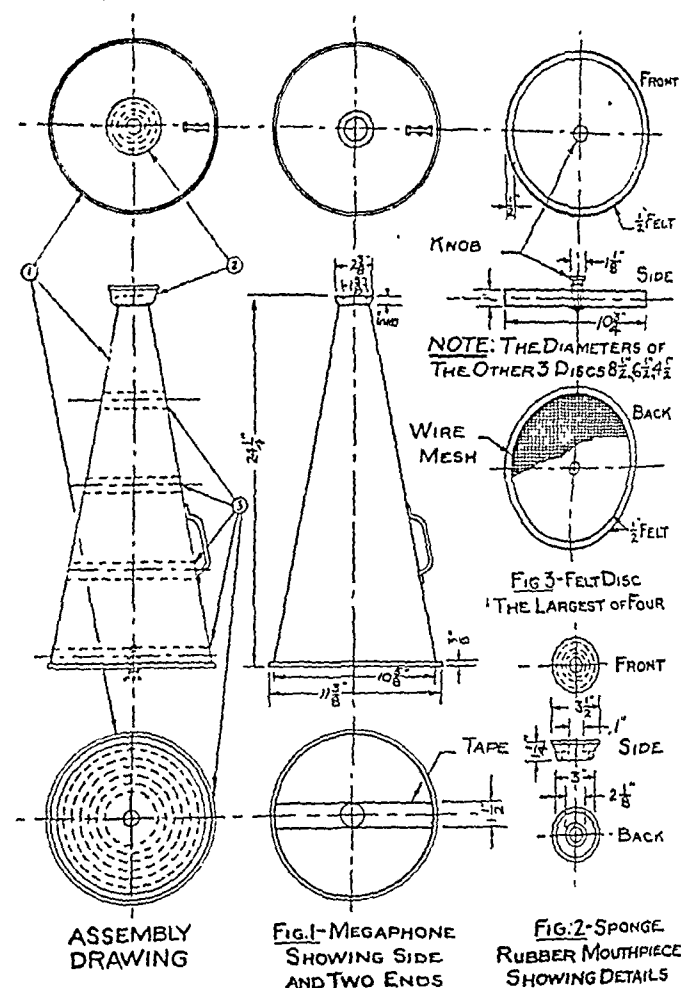
Conversational voice is from 40 to 50 decibels above the normal threshold. The unmuted megaphone increases it 20 decibels more or from 60 to 70 decibels above the normal threshold and an even greater increase may be obtained by shortening the distance between the megaphone and the patient which may be necessary in the case of the profoundly deafened individual. If each disk gives an attenuation of 10 to 15 decibels, the maximum attenuation of the four disks is approximately 50 decibels. Measurements have been made to determine whether there was frequency discrimination. This does not occur to any appreciable extent. In order to eliminate leakage of sound outside the megaphone a sponge rubber cushion is placed around the mouthpiece. The felt disks are constructed of one-half inch felt

backed by wire mesh for support, with a knob in the center to facilitate placement and removal. Two strips of tape are placed lengthwise inside the megaphone to keep the felt disks in place.

METHOD OF TESTING

The patient is seated in a chair 6 feet from the unmuted megaphone and asked to repeat the test sentences spoken by the examiner through the megaphone. The conversational voice is either attenuated by the placement of the felt disks inside the megaphone or made louder by shortening the distance between the megaphone and the patient, until a point is determined at which at least 60 per cent of the sentences can be repeated correctly. This distance is recorded and maintained throughout the rest of the test.

A hearing aid is then placed on the patient's ear, the type of aid and the ear on which it is used having been determined by previous audiometric tests. One or two of the smaller felt disks are placed in the megaphone, sentences again delivered to the patient and adjustment of the volume control of the hearing aid made.



Details of muted megaphone.

According to the minimum requirements for acceptance by the Council on Physical Therapy of the American Medical Association, an electrical hearing aid shall improve at least 30 decibels for speech the hearing of the deafened ear for which it is prescribed or fitted. If the patient can understand speech with three disks in place the aid is supplying a completely adequate gain of more than 30 decibels. If speech is not intelligible with the three disks the aid is inadequate. Four disks in place would mean a gain of about 50 decibels and is the maximum any hearing aid can give without distortion. In most instances this amount of gain is not necessary.

(This method should be used, of course, only when accurately controlled electrical equipment is not available.)

CONCLUSION

The so-called "muted megaphone" provides a simple accurate and inexpensive method for measuring hearing loss for speech and the gain which any hearing aid may give to the hard of hearing patient.

Special Article

VOLUNTARY NONPROFIT PREPAYMENT FOR HEALTH CARE

JOHN R. MANNIX

DETROIT

American medicine, American dentistry, American nursing, American hospitals have given our people the world's finest health service. With respect to education, service and research, American health service has reached a degree of perfection never realized in any other country on earth. This has been attained for the most part through the private practice of medicine, dentistry and nursing and through the operation of the voluntary nonprofit hospitals. It has not necessitated the national governmental control or compulsion which has been resorted to in an attempt to elevate the health standards in many other countries.

All Americans naturally want the best service for the sick and injured which the application of scientific principles will secure. We also want the greatest possible use made of medical knowledge and skill through the universal distribution of health services to all our people. But we must admit, I believe, that the economic advances in American health care have not kept pace with the scientific advances. The problem confronting us is how best to bring economic progress abreast of scientific progress.

Considerable progress already has been made in this direction. For example, there appears to be general acceptance of two important basic points: first, that arrangements must be made whereby Americans can budget for health care and, second, that the best method of budgeting for health care is through the use of a prepayment plan. The question on which there is not agreement is whether we must have federal control of all health services under a system which would incorporate compulsory prepayment or whether we shall continue the private practice of medicine, dentistry and nursing and support these services through voluntary nonprofit prepayment plans under professional sponsorship.

SOCIALIZATION OF MEDICINE

There is a common impression that the medical and allied professions bitterly oppose the "socialization of medicine." I believe that a fair definition of the term "socialization of medicine" would be the adaptation of medical care to the welfare of the community. Neither the professions nor the hospital groups have opposed adaptation or change in medical care which appeared to be desirable for the welfare of the people. On the contrary, a study of official actions of the national medical, dental and hospital associations over a period of twenty-five years indicates clearly that the official bodies of these associations have favored such changes as were and are necessary to meet the needs of the people. At the individual level, every doctor who rises in the middle of the night to tend the sick, who lowers his bill to meet the financial capacity of a patient, who contributes his time and effort to the needs of the indigent is literally "socializing" his services.

On the group side the House of Delegates of the American Medical Association has repeatedly taken action showing that it has no opposition to voluntary

group prepayment for medical and hospital care. Specifically, such actions were taken in 1920, 1934, 1935, 1937 and 1938. Similar actions were taken by the American Dental Association in 1938 and 1943. From 1933 to the present the attitude of the American Hospital Association has been to favor the greatest possible use of group prepayment. It is clear that voluntary group prepayment for medical and hospital care under professional sponsorship is a form of socialization of medicine favored by the professions and the hospitals.

On the other hand, the actions of the hospitals and the professions indicate that they strenuously oppose an approach to socialization which involves certain measures. These measures include (1) federal government control of medical practice, (2) denial of the individual's right to free choice of physician and hospital and (3) compulsory taxation or payment for health service.

NO NEED FOR FEDERAL CONTROL

To consider these proposed measures in sequence, the first of them—federal control and operation of health care—is neither necessary nor desirable. I say this for the following reasons:

1. In no other activity has there been, or is there likely to be, greater scientific progress than that of medical and hospital care under a system of private practice and voluntary operation. Progress in medical and other health care in the United States has been greater than in any country with governmental operation of health services—greater indeed than in any other country on earth.

2. A voluntary system is free of all possibility of political control or manipulation.

3. Federal regulation is not necessary. Through licensing, state regulatory bodies very satisfactorily control medical, dental and nursing practices at present. State bodies, being closer to the people and to local conditions, are in a much better position to avoid unintentional injustice or discrimination in the control of medical and allied practices.

4. Private operation is superior to governmental operation. I believe it will be conceded by most informed persons that the operation of voluntary hospitals has been superior to the operation of public hospitals. To quote the late eminent Dr. S. S. Goldwater, who had many years' experience in the private and public hospital fields and at one time was the director of the hospitals in the city of New York, the largest general hospital system in this country:

My own experience in New York showed me how far short government hospitals can fall from the perfection which has been attributed to them. Perfect conditions do not exist anywhere, and even in New York, where, as head of the city's hospitals, I worked under conditions as favorable as can be expected in government, the story has not been told of the impediments placed by government circumlocution in the way of anybody attempting to administer a large group of hospitals from a central office. The system as a whole failed to accomplish what I had in mind for the city because of the onerous conditions under which government work of all sorts had to be done. It could hardly be otherwise if the federal government attempted to exercise any measure of control over the voluntary hospitals.

Commenting on Dr. Goldwater's remarks, Dr. Howard T. Karsner, director of pathology, Western Reserve University School of Medicine, stated:

I also have had extensive experience with both private and publicly supported hospitals in Cleveland and other cities. A case in point is Cleveland City Hospital. . . . the budget

is but one item in the entire operation of a large city and is under the control of the city council. Expenditures are kept at a distressing minimum, improvements of equipment suffer and the research necessary to the advancement of medical science is distinctly handicapped. In certain respects the contrast with affairs at the University Hospitals is highly favorable to the latter.

This superiority of care in private hospitals has come to be appreciated by the American people, as is evidenced by the fact that the occupancy of government hospitals has dropped from 85 per cent to 75 per cent during the past five years, while the occupancy in private hospitals has increased from 70 per cent to 80 per cent.

The government has been responsible for the care of nervous and mental diseases in this country for a number of years. There is perhaps no branch of health care so neglected. The American people also have looked to the government for the care of the chronically ill, and again we find a very unsatisfactory situation.

5. There are sound reasons for holding that government should confine itself to those activities which cannot be performed readily by the people themselves. Some of these reasons were effectively stated by Hon. Leverett Saltonstall, governor of the State of Massachusetts, in the November 1943 issue of the *American Mercury*. "Throughout its entire history," Governor Saltonstall writes, "the fundamental principle of our democracy, as of every other democracy, has remained the same: the performance by government of only such services for the benefit of the individual citizen as he believes can best be performed by all citizens acting for the common good. . . . The average citizen wants to discard . . . government by edict, collectivism and experiments made simply for the sake of change. . . . He rightfully fears the weakening of individual enterprise, initiative and resourcefulness by an overgrown central government. . . . The great personal virtues bestowed by Washington, Jefferson and Lincoln must be revived. The country was built from the bottom up and not from the top down, and we must not reverse the direction."

6. Private philanthropy and individual charitable activities, giving outlet to some of the highest of human impulses, are cherished by the voluntary system but could have little or no place in a federal program.

7. The voluntary system preserves free choice of physician, dentist and hospital. Like "socialization," this matter of "free choice" usually is thoroughly misunderstood, perhaps because it is so easy to over-rationalize. It should go without saying that a physician responsible to his patient, rather than to an impersonal system, is much more likely to place the patient above the system. The patient should come first and under the voluntary system he does. From the other point of view the confidence which a patient has in his doctor, his dentist and his hospital often is a vital factor in his recovery or his willingness to submit to proper treatment.

I do not agree with the argument that the public has but little freedom in the choice of physicians at present. It is an equal fallacy, I believe, to maintain that the people are not interested in free choice because of their satisfaction with some of the great medical clinics, such as the Lahey Clinic in Boston, the Crile Clinic in Cleveland and the Mayo Clinic in Rochester, Minn. • While it is true that the patient has little choice of individual physicians in these clinics, he still has a choice between clinics or the choice of clinic physicians and physicians in private practice. Further, these clinics

are responsible directly to their patients and not to an outside and perhaps remote authority.

It seems useless to theorize that freedom of choice could be maintained under a federal health system. Such a notion is contrary to the historical proclivities of government and certainly is directly counter to the practice in governmental health services today.

NO NEED FOR COMPULSION

Compulsion is no more necessary than federal control and operation of health services. The only change necessary is in the method of payment, and this change is rapidly coming about by voluntary means. Over twelve million persons have enrolled for hospital service and over one million persons for medical service in the last few years alone, and there are ample indications that such programs have scarcely begun to realize their promise. As the American people already have learned to budget voluntarily for a host of other needs, they are now demonstrating that they welcome the opportunity to budget for health.

Our national experience with insurance, which is budgeting for possibilities or eventualities that are largely unpredictable for the individual purchaser, fully supports this observation. Americans are also the most insurance conscious people on earth. There are in force over sixty-five million life insurance contracts. Nearly all American families have life insurance for adult family members, thereby providing for expenses at the time of death. In one of America's largest cities last year only 192 persons—representing less than one half of 1 per cent of the deaths—were buried at government expense.

NO NEED FOR HASTE

Whenever it is demonstrated that there is no need for federal control of health service in America, and whenever it is demonstrated that there is no need to compel Americans to budget for health care, then we hear the cry that an acute situation exists—that there is a need for great haste—that there is a need for revolutionary tactics—that the evolutionary methods of voluntary plans cannot do the job in time. I submit that there does not exist a condition so acute that drastic action must be employed. I say this because:

1. We have the world's best health service, and it is folly to risk its destruction or deterioration through revolutionary action. The sole justification for haste is definite expectation of immediate overall improvement. Even if there were hope of ultimate superior improvement under a compulsory federal system—which I do not believe—it seems perfectly apparent that American medical practice would be in a state of turmoil for years.

2. The spectacular past progress of American health care will continue naturally under our voluntary system. There is no reason to believe that medical progress has stopped. There are excellent reasons for believing that it would be halted for a period of years by the upheaval resulting from compulsion, which by its very nature must be accomplished overnight.

3. Nonprofit, voluntary prepayment plans are expanding at a rate which would have been unbelievable five years ago. If more rapid progress is essential, government could do much to bring it about by encouraging and supporting these plans.

4. Haste is too often the strategy of the political reformer, the person who wants change for the sake of change, who is ready to sacrifice existing values for change and change alone.

ACCOMPLISHMENTS OF THE VOLUNTARY SYSTEM

Having considered what would be involved in federal control and compulsions, let us review the accomplishments of the voluntary system of health service in the United States. These accomplishments are enormous but have come about so naturally that our attitude toward them is dangerously matter of fact. We must realize that these accomplishments are a direct measure of the value of individual initiative and independent action by the people themselves. They include:

1. The education of 140,000 physicians, most of them in private medical schools. Forty-four of our medical schools, or 66 per cent of the total number, are connected with private universities.

2. The education of 70,000 dentists, most of them in private dental schools. Twenty-five of our dental schools, or 70 per cent of the total, are in private universities.

3. The education of 400,000 nurses, most of them in private nursing schools.

4. The providing of our armed forces with over 40,000 physicians, over 15,000 dentists and over 50,000 nurses.

5. A total of 4,021 hospitals, or 66 per cent of those in existence, under private supervision.

6. Over 316,000 hospital beds erected through voluntary giving at a cost of \$1,600,000,000.

7. Care of 8,500,000 hospital patients in 1943. This is 68 per cent of all patients admitted to hospitals.

8. Birth care of over 1,400,000 infants, or 82 per cent of all children born in hospitals.

9. The extension of the span of life from 34 to 64 years between 1879 and 1943 under our health system, which is predominantly private.

10. The present cost of health service, which is in excess of \$3,600,000,000 annually. Of this cost, 79 per cent is being met directly by the patients, 5 per cent is being met by philanthropy, 2 per cent is met by industry and only 14 per cent is met by the government.

11. The establishment of nonprofit hospital service plans in thirty-six states and the establishment of medical service plans in thirteen states. Such plans will be operated in all states at an early date.

It is evident that government has played a small part in the development of the health system in America. There is, however, a place for government. There is general agreement that government should continue to be an important influence in the fields of:

1. General public health.
2. Control of communicable diseases.
3. Care of tuberculosis.
4. Care of nervous and mental diseases.
5. Care of the chronically ill.
6. Care of war veterans. Here, however, veterans should be given free choice of hospital and should not be denied the use of private hospitals if they so desire.
7. Care of the indigent, but only to the extent that such persons cannot be cared for by private physicians, dentists and voluntary hospitals.

The government should supplement the efforts of private practitioners and voluntary hospitals in the foregoing fields. There is no reason why government should entirely supplant private and voluntary action; there are excellent reasons why it should cooperate with private effort.

THE PROGRESS OF PREPAYMENT PLANS

The real need is for the rapid extension of voluntary nonprofit prepayment plans for health service under the sponsorship of the medical and allied professions and the hospitals.

Of the many enthusiastic persons who attended the first conferences on group health care during 1933 and 1934, few visualized the subsequent growth and magnitude of this movement. Many friends of the movement still honestly believe and many opponents still contend that these plans have reached their full development and cannot be expected to reach a much larger proportion of the people. I am firmly convinced that, with the support of the medical and allied professions and with the support of hospital trustees and executives, it is possible to relieve all people in this country of the financial burden of health care in a reasonably few years through medical, dental and nursing plans and companion Blue Cross hospital plans. Considered from an objective point of view, the development of nonprofit prepayment plans has been little short of sensational.

Medical service plans under the sponsorship of medical associations had their origin in 1930, when various county medical societies throughout the states of Washington and Oregon offered medical service on a prepayment basis to people in those states. However, the medical service plan movement did not show much progress until the establishment of California Physicians' Service in 1939. This organization became the first statewide medical plan under the sponsorship and control of the medical profession. During the four years since its organization, seven state medical societies have organized similar plans. These are the societies of Massachusetts, New Jersey, Pennsylvania, Delaware, North Carolina, Michigan and Colorado. The Oregon Medical Association recently merged the original county medical plans of the state into a single statewide plan known as Oregon Physicians Service, so that there are nine statewide medical plans at the present time. In addition to statewide programs, plans under sponsorship of local medical associations are now operating in New York State, Missouri, Texas and Washington, and the medical professions in at least seven other states are giving serious consideration to the development of medical plans. The latter states include Maine, New Hampshire, West Virginia, Georgia, Ohio, Wisconsin and Utah.

Exact figures on medical service plan enrolment are not available at present, but as of Oct. 1, 1943 California Physicians' Service had enrolled approximately 88,000 subscribers; Michigan Medical Service had enrolled approximately 600,000 subscribers. Enrolment in Washington and Oregon exceeded 200,000 subscribers, and total enrolment in the thirteen states having medical plans was over 1,000,000 subscribers.

Throughout the entire nineteenth century and during the early part of the twentieth century there were many hospital service plans operated by individual hospitals, but it was not until 1932 that there was organized a plan offering free choice of hospital. This plan was started in Sacramento, Calif., in July 1932 and may be said to be the start of voluntary nonprofit hospital plans offering free choice of hospital. During 1933 and 1934 other free choice hospital plans were organized at Newark, N. J., St. Paul, Durham, N. C., New Orleans, Washington, D. C., and Cleveland. By 1935 twelve hospital service plans had enrolled 97,000 subscribers. By January 1940 sixty plans had

enrolled 4,500,000 subscribers. On Oct. 1, 1943 seventy-seven plans had enrolled over 12,000,000 subscribers in thirty-six states, the District of Columbia and three provinces of Canada. Having met the standards established by the American Hospital Association, these plans are privileged to use the association's Blue Cross *insigne*, denoting official approval. The thirty-six states and the District of Columbia where Blue Cross plans are operating contain approximately 87 per cent of the population of the United States, and the three provinces contain approximately 40 per cent of the population of the Dominion of Canada. Of the twelve states without Blue Cross plans, four already have special enabling acts, and efforts are being made by the Hospital Service Plan Commission of the American Hospital Association to establish plans in all twelve states at a very early date.

Considered superficially, these figures may not seem to have great significance. I submit that actually they have tremendous implications.

First, comparison of the rates of growth of these Blue Cross plans through the years demonstrates conclusively that their real growth has only started. They are adding more new subscribers today than at any other time in their history. Some critics have maintained that the first 12,000,000 subscribers were the easiest to enroll, that the plans will encounter increasing difficulties in future enrolment. This contention does not square with the facts concerning any new enterprise which meets eventual success. The beginning years—the years of trial and error, of amendment and adaptation—always are the most difficult. For Blue Cross plans the first 12,000,000 subscribers were not the easiest but the hardest to enroll.

Second, Blue Cross plans in a number of areas already have enrolled more than 50 per cent of the total population and are showing no signs of slackening in their growth. Nationally, Blue Cross plans may indeed have enrolled only 10 per cent of the population, but their potential certainly is much beyond that of the individual plans which have reached the highest percentage enrolments and actually, I believe, is sufficient to reach all who need such benefits.

Third, it would be pointless to pretend that Blue Cross plans have reached perfection any more than that a government program could instantly achieve anything remotely resembling a workable program. Blue Cross plans are still finding many new ways to bring better, more comprehensive, more readily available service to the people. Their growth will accelerate as these new techniques are put into effect. Whoever does the job, it takes time and experimentation. I believe that the most important part of that experimentation already has been concluded by Blue Cross plans, but I should like to cite some of the leading points which have been advanced by many serious thinkers in the program for future development of all nonprofit prepayment health services.

THE FUTURE OF VOLUNTARY PREPAYMENT PLANS

If voluntary plans are to complete the task they have set for themselves, they must seek advancement toward the following goals:

1. Plans—hospital and medical—must be made available in every state in the Union.
2. Wherever the population would be better served by a merger of existing hospital plans, such mergers should be effected.

3. Uniform contract providing comprehensive services should be universally adopted as rapidly as possible by Blue Cross plans. It is likely that all plans will adopt this contract within the next twelve months. Similar uniform, comprehensive benefits should characterize the development of medical plans, and the new Council on Medical Service and Public Relations of the American Medical Association is in a position to make a real contribution in this connection.

4. There should be reciprocity of benefits among all service plans, so that subscribers to any plan would be entitled to the same services regardless of whether the services were rendered in their own or in another plan area.

5. Health care plans must become generally available to the rural population. Several statewide plans already have made an excellent start in this direction.

6. Health care plans must become generally available to the self employed and to employees of small companies or businesses. Persons in these categories comprise only a small percentage of the total population but certainly are equally entitled to protection.

7. Consideration should be given to methods by which protection can be extended to those persons who are unable to pay for prepaid health services.

8. Programs enabling prepayment for dental service and home nursing service should be established, and existing health plans should cooperate with the dental and nursing professions in their development. The American Dental Association approved an outline for experimental prepayment dental plans under sponsorship of the dental profession at its 1943 annual meeting.

9. The medical and allied professions and the non-profit plans should undertake an adequate public education program to inform the nation of their contributions to the distribution of health services. Not only is this a brilliant success story which has never been adequately publicized, but it is a positive demonstration of what can be accomplished through private leadership without private gain, through public service without public compulsion.

VOLUNTARY EFFORT WILL SUCCEED

It seems clearly indicated that the great past success of nonprofit voluntary programs enabling prepayment for health services will be dwarfed only by their future progress. A decade ago fewer than 100,000 people enrolled in these plans during a period of three years. Today Blue Cross plans alone are enrolling more than 100,000 persons every fifteen days. The significance of this comparison cannot be ignored. It illustrates a trend which is gathering momentum in striking fashion. Within the near future it is confidently expected that Blue Cross plans, for example, will enroll new subscribers at a rate of 1,000,000 every two months. I believe it is entirely sound to estimate that half of the population of the United States will be enrolled by 1950, and that virtually all of the self-supporting population will be enrolled by 1960. Beyond this, there will be comparable advances in the other branches of health care.

In conclusion, I wish to predict that the magnificent progress which has characterized the scientific, educational and service advancement of American medicine, American dentistry and American nursing and hospital care will be matched in a few short years by equal voluntary achievement on the economic front.

Washington Boulevard Building.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

AUSTIN E. SMITH, M.D., Secretary.

ANTIPNEUMOCOCCIC SERUM-TYPE SPECIFIC (See New and Nonofficial Remedies, 1943, p. 531).

The following additional dosage forms have been accepted:

LEDERLE LABORATORIES, INC., PEARL RIVER, N. Y.

Antipneumococcic Serum (Rabbit), Type 6: Vials, 50,000 units. A refined and concentrated globulin solution of pneumococcus antibodies prepared by immunizing rabbits against virulent cultures of the type 6 pneumococcus. It contains 0.4 per cent phenol and 1-50,000 phenyl mercuric acetate as a preservative.

Antipneumococcic Serum (Rabbit), Type 9: Vials, 50,000 units. A refined and concentrated globulin solution of pneumococcus antibodies prepared by immunizing rabbits against virulent cultures of the type 9 pneumococcus. It contains 0.4 per cent phenol and 1-50,000 phenyl mercuric acetate as a preservative.

Antipneumococcic Serum (Rabbit), Type 10: Vials, 50,000 units. A refined and concentrated globulin solution of pneumococcus antibodies prepared by immunizing rabbits against virulent cultures of the type 10 pneumococcus. It contains 0.4 per cent phenol and 1-50,000 phenyl mercuric acetate as a preservative.

Antipneumococcic Serum (Rabbit), Type 11: Vials, 50,000 units. A refined and concentrated globulin solution of pneumococcus antibodies prepared by immunizing rabbits against virulent cultures of the type 11 pneumococcus. It contains 0.4 per cent phenol and 1-50,000 phenyl mercuric acetate as a preservative.

Antipneumococcic Serum (Rabbit), Type 12: Vial, 50,000 units. A refined and concentrated globulin solution of pneumococcus antibodies prepared by immunizing rabbits against virulent cultures of the type 12 pneumococcus. It contains 0.4 per cent phenol and 1-50,000 phenyl mercuric acetate as a preservative.

Antipneumococcic Serum (Rabbit), Type 13: Vial, 50,000 units. A refined and concentrated globulin solution of pneumococcus antibodies prepared by immunizing rabbits against virulent cultures of the type 13 pneumococcus. It contains 0.4 per cent phenol and 1-50,000 phenyl mercuric acetate as a preservative.

Antipneumococcic Serum (Rabbit), Type 15: Vial, 50,000 units. A refined and concentrated globulin solution of pneumococcus antibodies prepared by immunizing rabbits against virulent cultures of the type 15 pneumococcus. It contains 0.4 per cent phenol and 1-50,000 phenyl mercuric acetate as a preservative.

Antipneumococcic Serum (Rabbit), Type 16: Vial, 50,000 units. A refined and concentrated globulin solution of pneumococcus antibodies prepared by immunizing rabbits against virulent cultures of the type 16 pneumococcus. It contains 0.4 per cent phenol and 1-50,000 phenyl mercuric acetate as a preservative.

Antipneumococcic Serum (Rabbit), Type 17: Vial, 50,000 units. A refined and concentrated globulin solution of pneumococcus antibodies prepared by immunizing rabbits against virulent cultures of the type 17 pneumococcus. It contains 0.4 per cent phenol and 1-50,000 phenyl mercuric acetate as a preservative.

Antipneumococcic Serum (Rabbit), Type 18: Vial, 50,000 units. A refined and concentrated globulin solution of pneumococcus antibodies prepared by immunizing rabbits against virulent cultures of the type 18 pneumococcus. It contains 0.4 per cent phenol and 1-50,000 phenyl mercuric acetate as a preservative.

Antipneumococcic Serum (Rabbit), Type 19: Vial, 50,000 units. A refined and concentrated globulin solution of pneumococcus antibodies prepared by immunizing rabbits against virulent cultures of the type 19 pneumococcus. It contains 0.4 per cent phenol and 1-50,000 phenyl mercuric acetate as a preservative.

Antipneumococcic Serum (Rabbit), Type 20: Vial, 50,000 units. A refined and concentrated globulin solution of pneumococcus antibodies prepared by immunizing rabbits against virulent cultures of the type 20 pneumococcus. It contains 0.4 per cent phenol and 1-50,000 phenyl mercuric acetate as a preservative.

Antipneumococcic Serum (Rabbit), Type 21: Vial, 50,000 units. A refined and concentrated globulin solution of pneumococcus antibodies prepared by immunizing rabbits against virulent cultures of the type 21 pneumococcus. It contains 0.4 per cent phenol and 1-50,000 phenyl mercuric acetate as a preservative.

Antipneumococcic Serum (Rabbit), Type 22: Vial, 50,000 units. A refined and concentrated globulin solution of pneumococcus antibodies prepared by immunizing rabbits against virulent cultures of the type 22 pneumococcus. It contains 0.4 per cent phenol and 1-50,000 phenyl mercuric acetate as a preservative.

Antipneumococcic Serum (Rabbit), Type 23: Vial, 50,000 units. A refined and concentrated globulin solution of pneumococcus antibodies prepared by immunizing rabbits against virulent cultures of the type 23 pneumococcus. It contains 0.4 per cent phenol and 1-50,000 phenyl mercuric acetate as a preservative.

Antipneumococcic Serum (Rabbit), Type 24: Vial, 50,000 units. A refined and concentrated globulin solution of pneumococcus antibodies prepared by immunizing rabbits against virulent cultures of the type 24 pneumococcus. It contains 0.4 per cent phenol and 1-50,000 phenyl mercuric acetate as a preservative.

Antipneumococcic Serum (Rabbit), Type 25: Vial, 50,000 units. A refined and concentrated globulin solution of pneumococcus antibodies prepared by immunizing rabbits against virulent cultures of the type 25 pneumococcus. It contains 0.4 per cent phenol and 1-50,000 phenyl mercuric acetate as a preservative.

Antipneumococcic Serum (Rabbit), Type 27: Vial, 50,000 units. A refined and concentrated globulin solution of pneumococcus antibodies prepared by immunizing rabbits against virulent cultures of the type 27 pneumococcus. It contains 0.4 per cent phenol and 1-50,000 phenyl mercuric acetate as a preservative.

Antipneumococcic Serum (Rabbit), Type 28: Vial, 50,000 units. A refined and concentrated globulin solution of pneumococcus antibodies prepared by immunizing rabbits against virulent cultures of the type 28 pneumococcus. It contains 0.4 per cent phenol and 1-50,000 phenyl mercuric acetate as a preservative.

Antipneumococcic Serum (Rabbit), Type 29: Vial, 50,000 units. A refined and concentrated globulin solution of pneumococcus antibodies prepared by immunizing rabbits against virulent cultures of the type 29 pneumococcus. It contains 0.4 per cent phenol and 1-50,000 phenyl mercuric acetate as a preservative.

Antipneumococcic Serum (Rabbit), Type 31: Vial, 50,000 units. A refined and concentrated globulin solution of pneumococcus antibodies prepared by immunizing rabbits against virulent cultures of the type 31 pneumococcus. It contains 0.4 per cent phenol and 1-50,000 phenyl mercuric acetate as a preservative.

Antipneumococcic Serum (Rabbit), Type 32: Vial, 50,000 units. A refined and concentrated globulin solution of pneumococcus antibodies prepared by immunizing rabbits against virulent cultures of the type 32 pneumococcus. It contains 0.4 per cent phenol and 1-50,000 phenyl mercuric acetate as a preservative.

SULFAPYRIDINE SODIUM (See New and Nonofficial Remedies, 1943, p. 189).

The following product has been accepted:

LEDERLE LABORATORIES, INC., PEARL RIVER, N. Y.

Solution Sodium Sulfapyridine (Sterile) 25% W/V: 10 cc.

NICOTINIC ACID (See New and Nonofficial Remedies, 1943, p. 596).

The following dosage form has been accepted:

WILLIAM R. WARNER & Co., INC., NEW YORK

Tablets Nicotinic Acid: 50 mg.

serves apparently as the precursor for the bulk of urinary ammonia. The administration of glutamine to a dog in which acidosis had been produced by the administration of hydrochloric acid definitely increased the excretion of ammonia. The excretion of ammonia could furthermore be depressed by changing from the hydrochloric acid acidosis to bicarbonate alkalosis, and with this change there was an accompanying decrease in the amount of glutamine removed from renal blood.

From the foregoing it appears that glutamine performs an important physiologic role as the precursor of the major portion of urinary ammonia in a mammal. Amino acids may possibly be a minor source, but urea is definitely not the precursor of ammonia in urine. Elimination of ammonia by the kidneys does, of course, decrease the amount of nitrogen available for synthesis of urea by the liver. This relationship led in the past to the erroneous conception that urea was the precursor of urinary ammonia.

PURIFICATION OF THE POLIO-MYELITIC VIRUSES

Recently the study of poliomyelitis was taken up by the Institute of Physical Chemistry at the University of Uppsala, Sweden. This study at present centers on the poliomyelitic virus, its properties and reactions.

It is hoped that a basis may be built for attempts at therapy and chemoprophylaxis of the disease. The first steps in that direction, namely the purification of the virus, are described in this paper.

The mouse encephalomyelitis (Theiler's virus) and human poliomyelitis, are described in this paper.

He has taken advantage of the close relationship between the two viruses, especially with respect to their size and to the host reactions to infection.

Using the mouse virus as a model virus which can be studied in its natural host.

From a study of the present knowledge of the virus of infectious swine

encephalomyelitis enzootica suum, also called

swine vesicular disease, from the place in Bohemia in

which it was first recognized as an entity) (Gard concludes that there are "no essential distinguishing characteristics" between them except their species specificity.

Subsequently to the groups of rickettsias, pox and influenza viruses must now be added the group of poliomyelitic viruses—human, murine and porcine. The

establishment of types of poliomyelitis virus increases the opportunity for investigation of its basic properties. Only brief mention can be made of Gard's main result so far.

"Through a combination of salting out and differential centrifugation, preparations were obtained from infected mouse brains, the activities of which on a weight by weight basis were up to 200,000 times that of the start-

ing material." Small amounts of a similar substance were obtained from the spinal cord of human poliomyelitis. Gard looks on these substances as representing pure murine and human virus proteins which are closely related. He also isolated protein materials from human stools and from the intestinal contents of mice and other animals, but the evidence as to the nature of such material is not complete. He suggests that it concerns a virus, "ordinarily nonneurotropic, but under certain circumstances developing neurotropic properties." The intensified interest in poliomyelitis is thus yielding notable advances not only in the United States but elsewhere in the world.

MICROBIOLOGIC ANALYSIS OF VITAMINS

Almost a century ago micro-organisms were recognized as sources of danger to man in the fields of medicine, of technology and of food preparation. However, conviction has also prevailed that certain bacteria, molds and yeasts are also of great service to mankind. The fermentation industries, including distilling, brewing and baking, the production of organic food acids on a commercial scale, the cheese industry, the white lead industry and recently the production of penicillin are among the many commercial activities based on one or more phases of the peculiar metabolism of micro-organisms.

Recently yeasts, molds and bacteria have been found extremely specific in their nutritive requirements; in many instances these micro-organisms need the food factors which have been shown to be important in promoting the nutritive success of mammals. By suitable adjustment of the basal medium the amounts of vitamins present in a sample may be determined by measuring the growth of the micro-organism or the formation of some product of its metabolism under narrowly controlled experimental conditions. As a result the time consuming bioassay for vitamins with laboratory animals and the laborious chemical methods have been supplemented, and to some degree replaced, by the more rapid microbiologic assays, particularly in connection with estimations of the vitamins in the B complex. Thus, various strains of yeast¹ have been employed for the quantitative determination of thiamine (B₁), pyridoxine (B₆), biotin and inositol; either the production of carbon dioxide or the turbidity caused by the growing yeast cells serves as a criterion of response. *Lactobacillus casei*² requires riboflavin, biotin and pantothenic acid for growth, and the titration of the lactic acid produced by this organism during a

1. Gard, S.: Purification of Poliomyelitis Viruses: Experiments on Murine and Human Strains, supplementum 143, Acta med. Scandinav., 1943.

1. Shultz, A. S.; Atkin, L., and Frey, C. N.: J. Indust. & Engin. Chem., Anal. Ed. **14**: 35, 1942; **15**: 141 (Feb.) 1943. Kögl, F., and Tönies, B.: Ztschr. f. physiol. Chem. **242**: 43, 1936. Snell, E. E.; Eakin, R. E., and Williams, R. J.: J. Am. Chem. Soc. **62**: 175, 1940. Williams, R. J.; Stout, A. K.; Mitchell, H. K., and McMahan, J. R.: Pub. 4137, Univ. Texas, 1941, p. 27.
2. Snell, E. E., and Strong, F. M.: J. Indust. & Engin. Chem., Anal. Ed. **11**: 346, 1939. Shull, G. M.; Hutchings, B. L., and Peterson, W. H.: J. Biol. Chem. **142**: 913 (Feb.) 1942. Pennington, Derrol; Snell, E. E., and Williams, R. J., ibid. **135**: 213 (Aug.) 1940.

period of incubation serves admirably as a quantitative measure of these vitamins in the medium. At present the estimation of the concentration of niacin³ in a sample is made by employing *Lactobacillus arabinosus*. A mold, *Neutrospora sitophila*,⁴ is used to measure the amount of pyridoxine (B₆) in food materials and tissues; in this case the final estimation is made by weighing the dried mycelium.

The foregoing are representative examples of microbiologic vitamin analysis. The accepted methods of this class give results agreeing satisfactorily with chemical and animal assays. Economy of time and space represent the great advantages inherent in microbiologic assays. Further studies of the metabolic needs of microorganisms will indicate further use for yeasts, molds and bacteria in biochemical analysis, with consequent immediate benefit in food analysis and ultimate advantage in medicine.

Current Comment

SYMPATHECTOMY FOR HYPERTENSION

None of the proposed treatments for so-called essential hypertension have yet withstood critical scientific evaluation. Among the modern methods of treatment which have received particular attention is sympathectomy. Ayman and Goldshine¹ recently reported a late follow-up study of 14 patients who had undergone a variety of sympathectomy denervations and who had been subjected to unusually detailed controlled study. One patient died a few days after operation, but in 5 of the remaining 13 there was definite prolonged nontoxic lowering of the blood pressure; 4 who had been almost wholly incapacitated before operation returned to full activity afterward. The studies of the Boston investigators do not clarify the reasons for the failures encountered, but it was apparent that so-called grade 4 patients did not respond. Success in general was more constant in those patients subjected to extensive denervation. Finally some were apparent failures only when placed against the background of standard clinic readings of the blood pressure, whereas the home blood pressure method revealed real improvement. The care with which this study of a small group was carried out, the duration of the period of observation and the qualifications of the investigators support their conclusion that therapy by sympathectomy should be considered in patients with essential hypertension in whom progressive elevation of blood pressure is found after long and careful study or in whom any evidence of beginning vascular damage is demonstrated. In the light of these favorable results it would seem desirable for other investigators to report promptly the results of comparable studies in similar groups.

³ Snell, E. E., and Wright, L. D.: *J. Biol. Chem.* **139**: 675 (June) 1941.

⁴ Stokes, J. L.; Larsen, Alma; Woodward, C. R., Jr., and Foster, J. W.: *J. Biol. Chem.* **150**: 17 (Sept.) 1943.

¹ Ayman, David, and Goldshine, Archie D.: *Blood Pressure Determinations in Patients with Essential Hypertension. III. Evaluation of Sympathectomy Over a Three Year to Five Year Period*, *New England J. Med.* **229**: 799 (Nov. 25) 1943.

RED CROSS FUND CAMPAIGN

Elsewhere in this issue (page 581) appears a summary of some of the wartime activities of the Red Cross. The services performed by this organization are now unprecedented in scope and importance. Physicians, who are probably more competent to judge the value of Red Cross work than are any other group, will doubtless support this campaign for funds by word and deed.

NO SENSITIVITY TO RATION TOKENS

On February 27 the Office of Price Administration issues its new ration tokens, made of vulcanized fiber. Some publicity just released, cleared and issued through facilities of the Office of War Information informs us that these tokens are "harmless to the handler." The U. S. Public Health Service has been making patch tests, including investigations of the raw materials of which the tokens are made and of the finished tokens, for more than five months; "the tokens failed to irritate or sensitize the skin of any of those on whom they were tried." Perhaps people are less sensitive to war measures than they were at the beginning. Furthermore, the manufacturers of the token materials have advised the OPA that "there has been no case in which an employee suffered an unfavorable reaction." Any member of a ration board can, however, describe reactions that were, to say the least, unfavorable. It seems that the new ration tokens are made of vulcanized fiber, which is the material used for sales tax tokens in many states, for tabbing hotel keys and for dog licenses. These preliminary uses have no doubt accustomed many people to the feel of vulcanized fiber. Just how sensitive the public is going to be to the new ration tokens from a psychological point of view, time will tell.

THYMECTOMY FOR MYASTHENIA GRAVIS

Nellen¹ reports an instance of apparent cure following thymectomy in a case of typical myasthenia gravis in a nurse aged 23. In view of the spontaneous remissions in myasthenia gravis, time alone can tell whether the cure will be permanent; but, on the basis of the recorded results of thymectomy since its introduction by Blalock and his associates in 1939, Nellen concludes that the evidence at hand warrants removal of the thymus in every case of the disease. One may assume that myasthenia gravis may be caused by some substance or mechanism in the production of which the thymus takes an essential part. This assumption is supported by the frequency of cellular hyperplasia in the thymus in neurasthenia. Resumption of experimental investigations interrupted by the war no doubt will throw new light on problems connected with the thymus. In any case the results of thymectomy in myasthenia gravis should continue to receive close study.

¹ Nellen, Maurice: *Thymectomy for Myasthenia Gravis*, *Brit. M. J.* **2**: 778 (Dec. 18) 1943.

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeons General of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war, and such other information and announcements as will be useful to the medical profession.

ARMY

BRIG. GEN. PERCY J. CARROLL AWARDED DISTINGUISHED SERVICE MEDAL

Brig. Gen. Percy J. Carroll, formerly of Washington, D. C., has been awarded the Distinguished Service Medal for "exceptionally meritorious service to the Government in positions of great responsibility from 8 December 1941 to 10 December 1943. When the decision not to defend Manila was reached, General Carroll arranged the evacuation from Manila to Australia in an improvised hospital ship of a large number of patients, ably anticipating and overcoming many serious obstacles. After his arrival in Australia he rendered distinguished service, serving as Chief Surgeon of the United States Army Services of Supply, Southwest Pacific area, and of the United States Army Forces in the Far East. Initially he planned and supervised the organization of the medical service for the command and the assembly of medical units and installations. He was most successful in making interim arrangements for the sharing by United States personnel of Australian medical facilities and in overcoming shortages of personnel and equipment by resourceful improvisation. During the early New Guinea campaigns he caused the organization of portable surgical hospitals, the high mobility of which made them invaluable. He worked constantly on means to combat malaria and to deal with other special problems of this theater. General Carroll's extensive military experience, energy and foresight enabled him to meet a multiple of problems under most unusual and adverse conditions, both in combat and in service areas, and to accomplish his mission with conspicuous success." Dr. Carroll graduated from St. Louis University School of Medicine in 1914 and has been in active service since June 25, 1916.

INDIANA UNIVERSITY HOSPITAL UNIT COMMENDED

Army General Hospital 32, made up of doctors and dentists of Indiana recruited under the sponsorship of the Indiana University Medical Center, Bloomington, and now stationed in England, received the commendation of Major Gen. John C. H. Lee, commanding the service of supply of the United States Army in the European theater, and of Brig. Gen. Paul R. Hawley, chief surgeon of the same command. Copies of the letters of commendation written by Generals Lee and Hawley were sent to Dean W. D. Gatch of the Indiana University Medical Center through Col. Cyrus J. Clark, former Indianapolis physician and medical school faculty member, who commands the hospital. General Lee stated that "never expecting less than the highest standards from the Medical Corps, it is none the less gratifying to find things so well in hand." General Hawley made this additional comment: "The Chief Surgeon is very proud of Indiana University's 32 General Hospital. The medical service of the European Theater of Operations has a very high standard. That you have met that standard so soon after your arrival in this theater is evidence of the fine personnel and the fine leadership of your organization. You are proper Hoosiers; and your Chief Surgeon is one Hoosier who is proud to be a fellow citizen of yours."

The unit was commissioned in June 1942, assigned for training at Camp Bowie, Texas, and has been stationed for several months in England. The nurse personnel of the unit has been assigned to other overseas service.

NEW BULLETIN FOR AIR SURGEONS

The *Air Surgeon's Bulletin* made its appearance in January. It will serve as a key source of information for flight surgeons and the many groups of medical department officers working with them, presenting information to the army air forces overseas of the developments, advances and changes emanating from the organization, equipment, training, service and research activities conducted at home. It will also serve as a general medium for official expression of opinions and interpretation.

EXPERT SURGERY ON FRONT LINES LOWERS FATALITIES

The War Department recently announced that hospital fatalities in this war are less than half the number experienced in World War I because the Army has taken surgery to the front lines to insure prompt treatment of wounded men by experts. Hundreds of highly skilled surgeons, trained technicians and surgical nurses are organized today in every theater of operations where American troops are fighting or preparing to fight. They are known as Auxiliary Surgical Groups, and these men and women often work as separate units in collaboration with evacuation hospitals within the combat zone, only a short distance from the fighting lines. They have their own surgical equipment, tents and special trucks which carry sterilizers and an auxiliary power unit to provide current for electric lights. At present an Auxiliary Surgical Group is composed of more than fifty teams and other personnel. Approximately half of them are general surgical teams and the remainder are specially qualified to do orthopedic, maxillofacial, nerve, chest or brain surgery. The personnel of each team varies according to the job it is called on to do. A general team may consist of a general surgeon, an assistant surgeon, an anesthetist, a nurse and two surgical technicians. With them go truck drivers and other assistants needed in the situation confronting them. In jungle areas where no wheeled vehicles can move, they have recently organized portable surgical hospitals the nucleus of which is a slightly larger surgical team than the roving teams in other areas. These teams, composed of four officers and thirty-three enlisted men, load all their instruments, tents, dressings, medicines and other equipment on their backs and transport them as far forward as they are allowed to go. Then they set up their hospitals under canvas and begin operating, applying casts, setting broken legs and arms, giving other medical care—often under shell and rifle fire—and moving men back to the rear as rapidly as their wounds and transportation facilities permit.

In the present war less than 3 per cent of the men wounded in battle die after being admitted to a hospital, compared with 7.4 per cent who died in hospitals in World War I. This record, according to Major Gen. Norman T. Kirk, the Surgeon General, is attributable to prompt and proper surgery, the use of large quantities of blood plasma together with whole blood when it is needed, the use of sulfonamide drugs taken internally and used directly on wounds, competent, adequate nursing care, and rapid transportation to the rear. General Kirk declared that "In contrast to previous wars the present conflict is key-noted by a high degree of mechanization and mobility, and if proper medical aid is to be given to wounded men the surgical teams must keep pace with the attack. The sooner the treatment of the wounded can be instituted, the more successful are the results. As a result of the establishment of the present

system of care and evacuation, the time elapsing between the occurrence of an injury and first aid care averages less than one hour. The time between injury and emergency surgery at an evacuation hospital or clearing station in which surgical teams are operating is less than ten hours. This plan for the care of

the injured in the combat zone, which couples speed of evacuation with advancement of hospital facilities, permits not only application of life saving surgical measures but also marked reduction of the serious complications and morbid consequences that would otherwise occur."

MISCELLANEOUS

RED CROSS WAR FUND CAMPAIGN

The 1944 campaign for funds of the American Red Cross will be carried out throughout the country from March 1 to March 31. In order to fulfil its many obligations to the armed forces and people on the home front, the American Red Cross is seeking help to maintain a continuous procession of blood donors to supply some 5 million blood donations during 1944; nurses must be recruited for the Army and Navy at a rate of about 2,500 each month, and Red Cross field directors and other trained personnel must be stationed at military and naval posts and hospitals to help our fighting men and their families when personal trouble arises. The Red Cross must continue to maintain a state of alert on the home front, and disasters must be met as they occur. Nurse's aides and first aiders must be trained and other educational projects continued. Surgical dressings must be made and food parcels for distribution to prisoners of war must be packed. Today the functions of the Red Cross are spread over all the world and must be carried out by a multitude of professional as well as voluntary workers. Since all activities of this organization are financed by voluntary gifts and contributions, the American Red Cross

is seeking financial aid in trying to raise its 1944 war fund. Contributions will assure maintenance of all Red Cross services and will help to save many lives.

DR. GEORGE BAEHR RETIRES AS CHIEF MEDICAL OFFICER, O. C. D.

The United States Office of Civilian Defense announces the retirement of its chief medical officer, Dr. George Baehr, March 1, after two and a half years of service. He will be succeeded by Dr. W. Palmer Dearing, who has served as assistant chief medical officer since the establishment of the Medical Division of the Office of Civilian Defense.

Many months before the attack on Pearl Harbor, the Medical Division of the Office of Civilian Defense was assigned the responsibility for the protection of the civil population of the country and of its outlying territorial and insular posses-

sions against the hazards of enemy attack and other wartime disasters. In June 1941 Dr. Baehr was authorized by the Surgeon General, U. S. Army, to resign a reserve commission in the Army to accept a commission as medical director in the United States Public Health Service for assignment to the

newly created Office of Civilian Defense to organize its Medical Division. Under his direction a staff of technical experts was assembled, regional medical and sanitary engineering offices were established and an emergency medical service was organized in every state and local community throughout the country. An organization for protection against war gases was set up in the coastal states and in the major industrial centers in the interior, many thousands were trained in the technics of rescue work and a program of passive protection and mutual aid for water supply systems and sanitation facilities has been established in all states.

Other achievements of the Medical Division include the establishment of a nationwide system of casualty receiving hospitals, 321 potential emergency base hospitals in twenty coastal states, 180 hospital blood and plasma banks, reserve depots of dried and frozen plasma in 400 cities, more than 120 affiliated hospital units, each consisting of

15 physicians, surgeons and specialists commissioned in the Reserve of the U. S. Public Health Service, and 80 emergency nursing units, each composed of 22 nurses. At the instigation of the Medical Division and with its assistance, 150,000 volunteer nurses' aides have been trained under the Red Cross for wartime volunteer service in hospitals. In recognition of his services to the hospitals of the country in time of war, the American Hospital Association at its recent annual meeting voted a special citation to Dr. Baehr and elected him to honorary membership.

On his retirement as chief medical officer, Dr. Baehr will resume the professional and teaching responsibilities in New York City which he laid down when called to duty in June 1941 in anticipation of the entry of the United States into the world conflict. He is clinical professor of medicine at the College of Physicians and Surgeons of Columbia University, chief of the first medical service at the Mount Sinai Hospital,



Poster used in 1944 war fund campaign

New York, and a trustee of the New York Academy of Medicine. In 1915 and 1916 he served in the Balkans and in Russia as a member of the American Red Cross Sanitary Commission to combat epidemic typhus. After our entry into the last war he was called into military service and served in France with the American Expeditionary Forces as commanding officer of Base Hospital No. 3. He has served also in recent years as a member of the Public Health Council of the State of New York, the technical board of the Milbank Memorial Fund, the scientific board of the Institute of Public Health Research and as chairman of the Committee on Public Health Relations of the New York Academy of Medicine.

RUSSIAN WAR RELIEF, INC.

Officers of Russian War Relief, Inc., 11 East 35th Street, New York City, reported that \$15,781,333.74 worth of relief supplies were consigned to the Soviet Union during 1943. The American people contributed \$7,742,430.32 worth of clothing, seeds, medical supplies and miscellaneous gifts in addition to cash contributions through war chests and the National War Fund. Total administrative, promotion and operating costs, including expenses of more than 400 Russian War Relief committees throughout the country, totaled only 4.43 per cent of income. Medical supplies and clothing comprised the bulk of goods shipped during 1943, according to the agency's report, which showed that 70.07 per cent of shipments were clothing, 20.42 per cent medical and surgical supplies, 4.35 per cent seed and foodstuffs, and miscellaneous relief items such as sewed and knitted garments, watches and medical books. A \$21,000,000 goal for 1944 recently announced by the Russian War Relief board of directors will be reached by a continued goods in kind campaign and the purchase of clothing and medical supplies with a \$9,000,000 allocation from the National War Fund, and C. Carter, president of Russian War Relief, said. He said that a campaign for 3,000,000 household utility kits recently launched by the agency is already receiving the wholehearted support of Americans and that he was confident the agency would again exceed its own goal for the year.

WARTIME GRADUATE MEDICAL MEETINGS

Additional subjects and speakers for Wartime Graduate Medical Meetings have just been announced:

At the Station Hospital, Fort Niagara, N. Y.: Asthma, Bronchitis and Bronchiectasis, Dr. Harold Schweitzer, March 1; Neurotropic Virus Disease, Dr. David K. Miller, March 15.

At the Halloran General Hospital, Staten Island, N. Y.: External Diseases of the Eye and Glaucoma, Dr. Richard Townley Paton, March 7.

At Camp Upton, New York: Diagnosis and Treatment of Malaria, Dr. Henry E. Meleney, March 6; Clinical Application of Protein Metabolism, Dr. Frank Co-Tui, March 13; Early Diagnosis of Syphilitic Heart Disease, Dr. Edwin P. Maynard Jr., March 20; Cardiac Irregularities, Dr. Harry Gold, April 3.

At Mason General Hospital, New York: Diagnosis and Treatment of Malaria, Dr. Henry E. Meleney, March 6; Clinical Application of Protein Metabolism, Dr. Frank Co-Tui, March 13; Early Diagnosis of Syphilitic Heart Disease, Dr. Edwin P. Maynard Jr., March 20; Cardiac Irregularities, Dr. Harry Gold, April 3.

At Station Hospital, Presque Isle, Maine: Blood Dyscrasias and Transfusions, Dr. Charles S. Davidson, March 16.

At U. S. Naval Hospital, Portsmouth, N. H.: Peripheral Vascular Disease, Dr. Richard H. Wallace, March 16.

At U. S. Naval Hospital, Chelsea, Mass.: The Pneumonias and Other Respiratory Infections, Dr. Maxwell Finland, March 16.

At Cushing General Hospital, Framingham, Mass.: Stomach, Biliary Tract, Intestinal Disorders, Dr. Merrill C. Sosman, Dr. Simeon B. Wolbach, Dr. Francis C. Newton and Dr. E. Stanley Emery, March 16.

At Station Hospital, Camp Myles Standish, Taunton, Mass.: Burns and Reconstruction Surgery, Dr. Joseph H. Shortell, Dr. Francis Taylor and Dr. V. H. Kazanjian, March 16.

At Air Corps Station Hospital, New Haven, Conn.: Acute Infections of the Central Nervous System, Dr. Henry R. Viets, March 16.

At New London, Conn. (U. S. Coast Guard): Cardiac Neuroses, Cardiac Emergencies, Cardiac Rehabilitation, Dr. Paul D. White and Dr. Mandel E. Cohen, March 16.

At Grand Central Palace, New York: Common Skin Diseases in Soldiers, Dr. George C. Andrews, March 17 and 24; Peripheral Vascular Disease, Dr. A. Wilbur Duryee, March 31.

At Camp Shanks, Orangeburg, N. Y.: Management of Peripheral Nerve Injuries, Dr. Bronson S. Ray, March 2; Treatment of Anorectal Diseases in the Army, Dr. Frank C. Yeomans, March 16; Fractures, Dr. Clay Ray Murray, March 30.

At Halloran General Hospital, Staten Island, N. Y.: External Diseases of the Eye and Glaucoma, Dr. Richard Townley Paton, March 7.

At England General Hospital, Atlantic City, N. J.: Yellow Fever, Dr. William G. Sawitz, March 7; Low Back Pain, Dr. Paul C. Colonna, March 21.

NATIONAL NURSING COUNCIL FOR WAR SERVICE, INC.

Tribute was paid in the report presented at the annual meeting of the National Nursing Council for War Service, Inc., New York City, January 25, to volunteer service of home front nurses who are carrying on, largely in their spare time, the work of Nursing Councils for War Service in forty-eight states, the District of Columbia and nearly a thousand local communities. Stella Goostray, superintendent of nursing and principal of the School of Nursing, Children's Hospital, Boston, was reelected chairman of the council. Miss Goostray is also president of the National League of Nursing Education. Other officers elected were: vice chairman, Sophie C. Nelson, director of the Visiting Nurse Service for the John Hancock Mutual Life Insurance Company, Boston; secretary, Minnie Pohe, consultant, division of Nurse Education, U. S. Public Health Service; treasurer, Edward Robinson, treasurer of the Rockefeller Foundation; assistant treasurer, Henry B. Stimson.

State nursing councils for war service now exist in every state and the District of Columbia, and 987 local councils have been organized on city, county and district bases, it was reported. Nineteen of the state councils employ full time executives, and in the other states the state nurses' associations share their executives with the council. All are carrying some responsibility for procurement and assignment and for student recruitment programs. The Committee on Recruitment of Student Nurses, the oldest of the council's twelve committees, is being reorganized under Edith H. Smith, incoming chairman, to include representatives of lay groups assisting most actively with the recruitment program. Major emphasis in the committee's work will in the future be on student guidance.

HOSPITALS NEEDING INTERNS AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their house staff quotas allotted by the Procurement and Assignment Service:

(Continuation of list in THE JOURNAL, February 19, p. 516)

CALIFORNIA

St. Joseph's Hospital, San Francisco. Capacity, 244; admissions, 7,218. Sister Mary Raymond, Superintendent (2 assistant residents—mixed).

MONTANA

Murray Hospital Clinic, Butte. Capacity, 100; admissions, 2,785. W. H. Rex, Business Manager (1 intern).

ORGANIZATION SECTION

OFFICIAL NOTES

COUNCIL ON MEDICAL SERVICE AND PUBLIC RELATIONS PROPOSES WASHINGTON OFFICE FOR MEDICAL ECONOMIC RESEARCH

At its meeting in Chicago, February 14 and 15, the Council on Medical Service decided to investigate at once the factors concerned in establishing a Washington office. It was proposed that the Council on Medical Service and Public Relations suggest to the Board of Trustees of the American Medical Association the establishment in Washington, under the auspices of the Council on Medical Service, of an office of medical economic research. This office would be charged with the collection of information and statistical data concerning medical care, its distribution, its availability, its costs and its control in various portions of the United States. The information thus collected will be made available to the medical profession through the publications of the American Medical Association, also to the Bureau of Medical Economics of the American Medical Association for its studies of this problem, and to other appropriate

agencies interested in the extension of medical service, the provision of medical care and related subjects. The Board of Trustees has authorized the necessary preliminary steps for this project.

DOCTORS AT WAR

Radio broadcasts of Doctors at War by the American Medical Association in cooperation with the National Broadcasting Company and the Medical Department of the United States Army and the United States Navy are on the air each Saturday at 4:30 p. m. Eastern war time (3:30 Central war time, 2:30 Mountain war time and 1:30 Pacific war time).

The titles and guest speakers for the next three programs are as follows:

- February 26. "Share and Share Alike."
Speaker, Col. Rohland A. Isker, O. M. C., U. S. Army.
- March 4. "New Life Preserver."
Speaker, Capt. W. M. Craig (MC), U.S.N.R.
- March 11. "Battles Won in Laboratories."
Speaker, A. C. Ivy, Ph.D., M.D., Northwestern University.

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Change in Status.—S. 1633 has been reported to the House, proposing to amend the nurse training act to authorize the head of any federal agency, department or establishment to request and accept transfers of student nurses to a federal hospital who are transferable under the original act.

Bills Introduced.—The President has transmitted to the Congress a supplemental estimate of appropriation for the Federal Works Agency, in the amount of \$150,000,000, to continue the program for the construction of community facilities, including hospitals and health centers (H. Doc. 413). S. 1721, introduced by Senator Wagner, New York, proposes to authorize an appropriation of \$80,000,000 for the fiscal year ending June 30, 1945, and such sum as may be necessary for each succeeding fiscal year to enable the Secretary of Agriculture to provide for the maintenance, expansion and operation of school lunch and milk programs. H. R. 4188, introduced by Representative Sikes, Florida, proposes to amend the Railroad Retirement Act to provide annuities for individuals who are totally and permanently disabled and who have completed fifteen years of service. H. R. 4208, introduced by Representative Fay, New York, proposes to establish an executive department to be known as the Department for Veterans, at the head of which will be a Secretary for Veterans appointed by the President by and with the advice and consent of the Senate. H. R. 4216, introduced by Representative Rivers, South Carolina, would direct the Secretary of the Navy to establish a Dental Department in the Navy to function under the Surgeon General. The personnel of the Dental Department, it is proposed, will consist of (a) officers of the Dental Corps, one of whom will serve as Director of Dentistry and be directly responsible to the Surgeon General for the administration of dental affairs within the Bureau of Medicine and Surgery; (b) chief warrant and warrant officers in numbers not exceeding 5 per cent of the total number of officers in the Dental Corps, and (c) enlisted personnel in such ratings and distribution by pay grades within the ratings and in such numbers not to exceed 166 per cent of the dental officers as may be prescribed by the Secretary of the Navy. The Director of Dentistry will be appointed by the President from dental officers on active duty and while so serving will have the rank of rear admiral.

DISTRICT OF COLUMBIA

Changes in Status.—S. 1340 has passed the Senate, to establish a sanitary code governing the operation of restaurants in the District of Columbia. S. 1546 has passed the Senate, amending the law relating to the incorporation of Providence Hospital. The amendment would authorize the hospital to own property in excess of the \$150,000 limit contained in the act of incorporation. The hospital would also be authorized to conduct a school for the education and training of nurses and interns with authority to issue suitable certificates evidencing completion of their courses of training. H. R. 2644 has passed the House, granting additional powers to the Commissioners of the District of Columbia. This bill, among other things, would authorize the commissioners to provide for the waiver of payment by any person in the military services of any annual or other periodic fee required by law to be paid to the District of Columbia or to any board or commission as a condition to retaining or renewing any license or permit to engage in any business or calling or to practice any profession in the District of Columbia.

STATE MEDICAL LEGISLATION

Mississippi

Bills Introduced.—S. 145 proposes to authorize the establishment and operation of a state charity hospital and nurses' home to be located in or near Carthage, Leake County, Mississippi, and to be known as the Central Mississippi Charity Hospital and Nurses' Home. House Concurrent Resolution 25 proposes to authorize the appointment of a joint house and senate committee to look into the possibilities of establishing, by means of federal appropriations and private gifts, a tuberculosis sanatorium in one of the centrally located counties in the northern Supreme Court district of the state. H. 173 proposes to change the names of the State Insane Hospital at Whitfield and the East Mississippi State Hospital at Meridian to the State Hospital for the Mentally Ill and to the East Mississippi State Hospital for the Mentally Ill, respectively, and to provide that the supervision and control of each of the two hospitals be under the state board of health. H. 355 proposes to authorize the board of supervisors of any county, in its discretion, to expend not more than \$100 on each needy maternity case. H. 359 proposes to repeal the provisions of the criminal code

relating to abortion and to provide a penalty for any person who administers to any woman pregnant with child any medicine, drug or substance whatsoever, or who uses any instrument or other means with the intent to cause the woman to abort or miscarry, and thereby kills or destroys the products of conception, unless the same is necessary to save the life of the mother and has been advised by at least two reputable licensed physicians to be necessary for that purpose. The bill also proposes to require any person who assists in the performance of any operation to empty the uterus of the product of conception and who believes or has reason to believe that such operation is being unlawfully performed immediately to report such operation to the state board of health. The bill also proposes that any person who shall perform any operation by which the uterus is emptied of the product of conception or who shall empty the uterus of the product of conception by administering any medicine, drug or substance whatsoever, within five days after performing such operation or administering such medicine or drug to report the same to the registrar of vital statistics of the state board of health, giving, among other things, the names and addresses of the consulting physicians and the name and address of the hospital or clinic at which the operation was performed or at which the medicine or drug was administered. The bill further authorizes the state board of health to revoke the license of any licentiate convicted of any violation of the bill. H. 385, to amend the law relating to privileged communications, proposes that a patient be deemed to have waived the privilege conferred by statute on him with respect to the information obtained by his physician in attending him if the patient brings an action for damages on account of personal injuries or if the patient offers the physician or any other person as a witness to testify to his physical or mental condition.

New Jersey

Bills Introduced.—A. 55 proposes to enact an entirely new workmen's compensation act, the compensation to be paid out of a state insurance fund. An injured employee is to be entitled to receive "the best available medical, surgical or other attendance, care or treatment, nurse and hospital service, medicine, crutches and apparatus for such period as the nature of the injury or the process of recovery and rehabilitation may

require." The injured employee may select to treat him any physician authorized by the state workmen's compensation bureau, which is authorized to administer the act. S. 63 proposes to adopt an act providing for the payment of compensation to employees contracting silicosis or asbestosis by reason of their employment. S. 67 proposes to establish within the department of institutions and agencies a division whose duty will be to study the cause, mortality rate, treatment, prevention and cure of cancer and allied diseases. The department is to organize cancer clinics throughout the state and to provide for the care, treatment and prevention of cancer. Any person residing within the state for one year or more is to be eligible to receive without cost treatment contemplated by the bill. S. 74 proposes to permit any person holding a license to practice medicine and surgery in the state and who does not possess a degree of doctor of medicine to certify to the insanity of patients for admission to state and county mental hospitals.

South Carolina

Bills Introduced.—H. 878 proposes to create the Beaufort County Hospital Association to operate a hospital in Beaufort County for the treatment of charity and pay patients. H. 886 proposes to establish a hospital district in Charleston County to be known as the Cooper River Hospital District, which district is to be authorized to erect and maintain a hospital or hospitals. H. 946 proposes to authorize the establishment of nonprofit corporations to maintain and operate nonprofit hospital service plans whereby hospital care may be provided through established hospitals holding membership in the South Carolina Hospital Association or approved by the corporations in question.

Virginia

Bills Introduced.—S. 165, to supplement the medical practice act, proposes, in effect, to require the board of medical examiners to file with the secretary of the commonwealth a copy of the questions of each examination given by it within ten days after the examination. S. 170, to amend the uniform narcotic drug act, proposes so to define the term "narcotic drug" as to embrace "Isonipeccaine," which the bill defines as "the substance identified chemically as 1-methyl-4-phenyl-piperidine-4-carboxylic acid ethyl ester, otherwise known as Demerol, or any salt thereof by whatever trade name identified."

WOMAN'S AUXILIARY

Colorado

The Denver County auxiliary recently held a meeting at the Nurses' Home of the General Hospital in Denver. After the business meeting Oscar Wilde's book "Skin of Your Teeth" was presented. The auxiliary prepares dressings and bandages for the Colorado Society for the Control of Cancer and sews weekly for the Red Cross.

Michigan

The executive board of the Michigan auxiliary held its eighteenth midyear meeting and luncheon recently in Detroit. Mrs. John J. Walch, state president, urged two objectives for the year: (1) the cooperation of all members to defeat the Wagner-Murray-Dingell bill and (2) to aid in the nationwide campaign to recruit girls for the nursing profession.

The Jackson County auxiliary sent thirty-two Christmas boxes to members of the Jackson County Medical Society in service. St. Clair County auxiliary showed the film "R.N. Serving All Mankind" to senior high school girls in the county.

New Jersey

A report of the New Jersey auxiliary was recently published in the *Journal of the Medical Society of New Jersey*. Mrs. Asher Yaguda, president, said that the national chairman of public relations mentioned a New Jersey project planned by Mrs. Maelyn Baker. It is the afghan square "knitting while waiting" idea. Afghan squares begun with necessary needles and wool are placed in doctors' offices, and patients knit while waiting.

Members of the Mercer County auxiliary were hostesses to the state auxiliary on January 10 at a business meeting and buffet luncheon.

The Middlesex County Auxiliary, as part of its public relations program, has become members of the Public Forum of New Brunswick and vicinity.

The Ocean County auxiliary has a program this year of discussions on current medical subjects and book reviews. Its efforts are centered on helping the Blood Transfusion Fund.

The Essex County auxiliary and the Contemporary Club of Newark heard Dr. Quigley's talk on medical legislation. His subject was "Present Governmental Activities in the Field of Civilian Medicine."

Oklahoma

The Tulsa County auxiliary sponsored a picture for the recruitment of nurses at the Central High School. A talk was given to the girls by Mrs. C. H. Haralson on the value of nursing as a profession. The auxiliary entertained the wives of doctors in the service and honorary members.

Virginia

The Norfolk County auxiliary voted to sponsor a recreation room for one of the 375 camps in the area. At a recent meeting Mrs. J. W. Reed read a paper on "Contribution to Modern Medical Science Made by Jane Todd Crawford."

The Accomac-Norhampton auxiliary again won the silver vase for the largest percentage of attendance at its meetings. The vase, engraved with their name, will be on display at the Northampton-Accomac Hospital.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARIZONA

State Medical Meeting.—The annual meeting of the Arizona State Medical Association will be held at the Hotel Westward Ho, Phoenix, April 14-15. A program will be presented by members of the faculty of the University of Southern California School of Medicine, Los Angeles.

Arizona Medicine.—The official journal of the Arizona State Medical Association, *Arizona Medicine*, made its appearance with the January-February issue. On the president's page Dr. Otto E. Utzinger, Ray, president of the state association, submits an appeal against the Wagner-Murray-Dingell bill.

COLORADO

Gift of Radium for Indigent Patients.—Fifty-five mg. of radium has been given by the Dr. Alfred Freudenthal Foundation to the Colorado Branch of the American Society for the Control of Cancer. The radium will be placed with a committee appointed by the state medical society, which, in cooperation with Dr. Roy L. Cleere, secretary of the Colorado State Board of Health, will make it available for the exclusive use of indigent cancer patients in Colorado free clinics, according to the *Bulletin* of the American Society for the Control of Cancer. Dr. Freudenthal died in Denver, Dec. 22, 1940.

CONNECTICUT

Professorship in Nutrition Created at Yale.—George R. Cowgill, Ph.D., associate professor of physiologic chemistry, Yale University School of Medicine, New Haven, is the first incumbent of a newly created professorship in nutrition at Yale. Dr. Cowgill was a pupil of the late Lafayette B. Mendel, Sc.D., and has been a member of the department of physiologic chemistry since 1921.

ILLINOIS

Chicago

Dr. Wiggers to Address Heart Association.—Dr. Carl J. Wiggers, professor of physiology and head of the department, Western Reserve University School of Medicine, Cleveland, will address the annual meeting of the Chicago Heart Association at Huyler's Restaurant, February 29. His subject will be "Some Cardiovascular Aspects of Shock and Transfusion."

Anniversary of Psychiatric Institute.—A dinner will be held at the Standard Club, February 29, to observe the thirtieth anniversary of the Psychiatric Institute of the Municipal Court of Chicago. Charles W. Gilkey, D.D., dean of the Rockefeller Memorial Chapel, University of Chicago, will be the toastmaster. Dr. Harry Stack Sullivan, William Alanson White Foundation, Washington, D. C., will be the principal speaker. Among the speakers will be:

Hon. Edward J. Kelly, mayor of the city of Chicago.
Hon. Edward S. Scheffler, chief justice, Municipal Court of Chicago.
Hon. John P. McGoorty, judge of the Superior Court, Cook County.
Mr. Russell Ballard, director, Hull House, Chicago.
Dr. David B. Rotman, director, Psychiatric Institute of the Municipal Court of Chicago.

A feature of the meeting will be the presentation of a commemorative volume reviewing the history of the Psychiatric Institute, set up in 1914 by Chief Justice Harry Olson, who died in 1935. The first director was the late Dr. William J. Hickson, who was succeeded in 1929 by Dr. Meyer Solomon, associate in nervous and mental diseases, Northwestern University Medical School. Dr. Rotman became director in 1931.

INDIANA

Typhoid Outbreak Traced to Food Product.—A food product which is believed to be the source of a typhoid epidemic in north central Indiana is being removed from the market "as quickly as possible," state health officials reported February 11. It was stated that the name of the product or of the company manufacturing it was not disclosed, but it was indicated that "parties directly and indirectly connected with its production and distribution are giving wholehearted cooperation in the removal of the product from the market." A total of 162 typhoid cases had been reported up to February 11, with six deaths.

Personal.—William H. Headlee, Ph.D., recently appointed head of the division of tropical medicine and parasitology at Indiana University School of Medicine, Indianapolis, will leave in March to conduct a study of tropical diseases in Guatemala, Honduras and Costa Rica. Dr. Headlee was chosen for the work by the Association of American Medical Colleges, the study to be financed by the Markle Foundation in cooperation with the army medical corps.—Dr. Albert Fisher, North Judson, has been named health officer of Starke County, succeeding Dr. William J. Solt, San Pierre.—Dr. James C. Stafford, Plainfield, has been appointed coroner of Hendricks County to succeed Dr. Samuel Joseph Smith, who resigned when he moved to Indianapolis.

MICHIGAN

Advisory Group for Tuberculosis Control.—Announcement is made of members of an advisory committee of the Michigan Sanatorium Association named to work with state health authorities in coordinating institutional tuberculosis control measures. Members of the committee are Drs. Paul T. Chapman, director of tuberculosis hospitalization and field service of the Herman Kiefer Hospital, Detroit, chairman; John B. Barnwell, director of the tuberculosis division of the University Hospital, Ann Arbor; Willard B. Howes, medical director of the Detroit Tuberculosis Sanatorium; Edward W. Laboe, superintendent of the Michigan State Sanatorium at Howell, and Charles R. Smith, medical superintendent of the Copper Country Sanatorium at Houghton. The committee is to meet at least twice annually with representatives of the bureau of tuberculosis control of the state department of health for discussions of present and postwar problems.

Industrial Medical and Surgical Conference.—The Michigan State Medical Society will hold its annual postgraduate industrial medical and surgical conference at the Horace A. Rackham Educational Memorial, Detroit, April 6. Among the speakers will be:

Mohe E. Solworth, Louisville, Ky., sanitation consultant, *Newer Trends in Industrial Sanitation*.
Dr. Leonard E. Himler, Ann Arbor, *The Psychiatric Approach to Current Mental Health Problems in Industry*.
Samuel Peck, senior surgeon, U. S. Public Health Service Reserve, *How to Control Epidemics of Occupational Dermatitis, with Special Emphasis on the Epidermophytoses*.
Dr. Charles-Francis Long, Philadelphia, *Criteria for Employability of Individuals with Lung Pathology*.
Dr. Marion W. Jocz, Detroit, *Implant Rehabilitation Programs for Disabled Veterans*.
Dr. Melvin H. Pike, Midland, *Eye Pathology Due to Exposure to Organic Solvents*.
Dr. Carl A. Moyer, Ann Arbor, *A Comparison of Various Salt Solutions in the Treatment of Burns*.
Dr. John W. Hirshfeld, Detroit, *Clinical Uses of Penicillin*.

Dr. Kenneth E. Markuson, Lansing, chairman of the meeting, will give an address of welcome, and a luncheon session will be addressed by Major Frank H. Mayfield, M. C., A. U. S., on peripheral nerve injuries. The meeting is sponsored by the committee on industrial health of the state medical society and the Michigan Association of Industrial Physicians and Surgeons in cooperation with the department of postgraduate medical education of the University of Michigan, Ann Arbor, and the Wayne University College of Medicine.

MISSOURI

Personal.—Dr. Evarts A. Graham, Bixby professor of surgery, Washington University School of Medicine, St. Louis, was granted honorary fellowship in the Royal College of Surgeons of England at a ceremony in the British embassy in Washington, November 8.

Unapproved Medical School Surrenders Charter.—The Kansas City University of Physicians and Surgeons has agreed to surrender its charter and stop functioning June 1, it is reported. The school is said to teach both medicine and osteopathy, granting advanced standing in medicine to osteopathic students. It has not been recognized by the American Medical Association since 1928.

Radiologic Information.—A symposium on radiologic information was presented on January 25 by members of the Kansas City Radiological Society. Among the speakers were:

Dr. Charles Edgar Virden, *Dangers of Fluoroscopy*.
Dr. Galen M. Tice, Kansas City, Kan., *Carcinoma of the Lung*.
Dr. Lewis G. Allen, Kansas City, Kan., *Radiation Therapy in General Practice*.
Dr. David S. Dann, X-Ray Examination of the Heart and Aorta.
Dr. Everett R. Dewese, *Study of the Gastrointestinal Tract*.
Dr. Louis A. Scarpellino, *Intravenous Psychography*.
Dr. Edward H. Skinner, *Cell Type Knowledge in Tumor Therapy*.

Dr. Ira H. Lockwood conducted the seminar, and Drs. Clyde O. Donaldson and Oliver H. McCandless participated in the discussion.

NEW JERSEY

State Surgeons Meet.—The Society of Surgeons of New Jersey was addressed at a meeting in the Claridge Hotel, Atlantic City, January 29-30, among others by Dr. Charles H. deT. Shivers on "Rhabdomyosarcoma of the Spermatheca"; Dr. Homer I. Silvers, "Three Major Lesions of the Colon"; Major George E. Chittenden, M. C., A. U. S., "A New Approach to the Varicocele Problem," and Col. James P. Cooney, M. C., U. S. Army, "Unusual Roentgen Findings of Interest to the Surgeon."

Course in Tropical Diseases.—Dr. Arthur W. Grace, professor of clinical dermatology and syphilology, Long Island College of Medicine, Brooklyn, is conducting a course in tropical diseases in Newark under the auspices of the state department of health. The lectures, which opened February 16, will be given on alternate Wednesday evenings. A companion course in the parasitology of the diseases considered will be conducted by Thurlow C. Nelson, Ph.D., at New Brunswick on Saturday afternoon following each lecture by Dr. Grace. This course is open only to those registered in the lecture course.

NEW YORK

Personal.—Dr. N. Stanley Lincoln, since 1936 medical superintendent of the Mount Morris Tuberculosis Hospital, Mount Morris, has been transferred to a similar position at the Hermann M. Biggs Memorial Hospital, Ithaca, succeeding Dr. John K. Deegan, who has entered military service. Dr. Arthur M. Stokes, assistant superintendent of the Homer Folks Tuberculosis Hospital, Oneonta, has been named to succeed Dr. Lincoln at Mount Morris.—Dr. Paul H. Mahany, Albion, has been named coroner of Orleans County to fill the unexpired term of Dr. Ralph E. Brodie, Albion, who died January 9.—Dr. Eugene W. Bogardus, superintendent of Onondaga Sanatorium since 1940, has resigned, effective March 1, to become head of the medical department of the Reader's Digest Company, Pleasantville.

Graduate Lectures.—Dr. Foster Kennedy, professor of clinical medicine (neurology), Cornell University Medical College, New York, will address the Jefferson County Medical Society in Watertown and the St. Lawrence County Medical Society in Ogdensburg, March 9, on "Neuroses: Related to the Manic-Depressive Constitution." Dr. Ellery G. Allen, associate professor of clinical medicine and associate professor of clinical pathology, Syracuse University College of Medicine, Syracuse, will address the Cortland County Medical Society, Cortland, March 17, on "Diagnosis and Treatment of Anemia." Dr. James E. McCormack, New York, will address the Onondaga County Medical Society and the Syracuse Academy of Medicine, March 7, Syracuse, on "Penicillin Therapy." The lectures are a part of a postgraduate endeavor sponsored by the state medical society and the state department of health.

New York City

Dr. Loewi to Give Rothschild Lecture.—Dr. Otto Loewi, research professor of pharmacology, New York University College of Medicine, will present the Rothschild Lecture at Beth Israel Hospital, March 28, on "The Chemical Transmission of Nervous Impulse."

Meeting on Plastic Surgery.—At a meeting of the American Otorhinologic Society for the Advancement of Plastic and Reconstructive Surgery, February 25, at the New York Academy of Medicine, the following, among others, spoke:

- Dr. Jacob Daley, Retaining a Correct Septolabial Angle in Rhinoplasty.
- Dr. Matthew S. Ersner, Philadelphia, Nasal Injury in Dystocias.
- Dr. Bruno L. Griesman, Muscles and Cartilages of the Nose from the Standpoint of a Typical Rhinoplasty.
- Dr. Harold S. Vaughan, Surgical Correction of Congenital Lip Deformities.

Dr. John M. Converse of the American Hospital in Britain showed a film on "Reconstruction of Nose by Epithelial Inlay."

OHIO

Annual Cancer Institute.—The Ohio Division of the Women's Field Army of the American Society for the Control of Cancer sponsored its annual institute at the Deshler-Wallick Hotel, Columbus, February 2. Among the speakers were S. Gertrude Bush, R.N., Columbus, chief, division of public health nursing, Ohio Department of Health, on "Functions of the Public Health Nurse in the Cancer Control Program"; Mrs. Harold V. Milligan, national commander, "The Future of the Women's Field Army in the United States"; Dr. Clifford C. Sherburne, Columbus, president, Ohio State Medical Association, "The Physician and the Cancer Control Program," and H. D. Fish, assistant managing director, American Society for the Control of Cancer, "The Cancer Control Program in Secondary Schools."

Governor's Committee for Study of Mental Health.

On January 3 the "Governor's Committee on the Mental Health Program for Ohio" held its first meeting. Hal H. Griswold, Cleveland, attorney and former director of the state department of public welfare, was chosen chairman of the new group, and Leonard W. Mayo, dean of the School of Applied Social Sciences, Western Reserve University, Cleveland, vice chairman. Provision was made for the employment of a secretary. The committee was originally set up to formulate a mental health program for Ohio and at the recent meeting recognized three main divisions of the governor's assignment: the mentally ill, including the epileptic; the feeble-minded, or mentally deficient, and the defective delinquent and psychopathic. Subcommittees were appointed on each of these three divisions as well as a subcommittee to coordinate their work. Recommendations will be made in each field concerning the prevention, treatment, education, research, institutional and other personnel, buildings and equipment, and pertinent statutes. It was agreed that the committee (THE JOURNAL, January 22, p. 248) and the advisory council to the state division of mental diseases would act as a single committee to be known as the "Governor's Committee on the Mental Health Program for Ohio."

PENNSYLVANIA

Personal.—Dr. Richard J. Behan, Pittsburgh, has recently returned from an eight weeks trip to Mexico and Guatemala, where he studied the relationship of precolumbian and modern medicine.

Philadelphia

Personal.—Dr. Myer Solis-Cohen was recently appointed assistant director of public health of Philadelphia. Drs. Harrison F. Flippin and John D. McLean have been appointed members of the board of health.—Dr. Stephen E. Tracy, medical director of the Stetson Hospital for twenty-five years and associated with the institution for forty-one years, retired December 31. He has been succeeded by Dr. John D. Paul.

Special Lectures.—The Philadelphia County Medical Society plans a symposium on the "Early Diagnosis of Cancer" to be presented, March 8, under the auspices of the committee on cancer control. On April 5 Dr. Eugene M. Landis, professor of physiology, Harvard Medical School, Boston, will present the Mary Scott Newbold Lecture of the Philadelphia College of Physicians. He will discuss "The Hypertension Problem."

Dinner to Dr. Reeves.—On January 26 Dr. Rufus S. Reeves, recently appointed director of health of Philadelphia, was guest of honor at a dinner given by Dr. Anthony Sidoni Jr. Guests at the dinner included the mayor of Philadelphia and the chairmen of all the advisory committees to the director of health. As a result of an announcement at the dinner that in one Philadelphia school there appeared a mild epidemic of ringworm of the scalp among the children, steps are being taken to include tinea circinata, designated as reportable, on the communicable disease postal card.

SOUTH CAROLINA

Congressmen Oppose Wagner Bill.—The house of representatives of South Carolina on January 25 adopted a concurrent resolution by Representative Horne of Richland opposing the Wagner-Murray-Dingell bill.

Personal.—Dr. Isadore Schayer, Columbia, has been retired from the army (national guard), in which he was lieutenant colonel and post surgeon at Fort Moultrie, and has returned to his duties as professor of hygiene at the University of South Carolina, Columbia, it is reported. Dr. Schayer, who had a leave of absence from the university, reached the retirement age of 64 on May 1, 1943 but was retained on active military duty by a presidential order.

TEXAS

Meeting of Pathologists.—Dr. Paul Brindley, Galveston, was chosen president-elect at the semiannual meeting of the Texas Society of Pathologists, Dallas, January 30, and Dr. Albert H. Braden, Houston, was inducted into the presidency. Other officers include Dr. May Owen, Fort Worth, vice president, and Dr. John J. Andujar, Fort Worth, secretary-treasurer. The next meeting of the society will be held in San Antonio, May 4. At the recent meeting a complete code of ethics was drawn up, stress being laid on the urgent necessity of remedying the unfortunate practice of medical specialties by lay institutions. A resolution of protest was adopted on the teaching of medical technology by undergraduate colleges devoid of clinical facilities or medical supervision.

Professorship of Pathology Endowed at Baylor.—The Fulbright professorship of pathology has been endowed at Baylor University College of Medicine, Houston, under a contract executed between Mrs. Irene Fulbright, widow of R. C. Fulbright of Houston and Washington, and the Houston executive committee of the board of trustees of Baylor University, according to *Medical Record and Annals*. Under the agreement Mrs. Fulbright will make an annual cash contribution toward the expense of the professorship and has agreed to make the endowment permanent by naming Baylor University College of Medicine as the legatee of her estate on her death. Both Mr. and Mrs. Fulbright were students at Baylor. Mr. Fulbright during his life created a trust estate to become the property of the college of medicine after certain stipulations had been fulfilled. In the recent agreement it was provided that the trust fund by Mr. Fulbright will be used jointly with the funds to the college from Mrs. Fulbright to take care of the expense of the professorship. It is also provided that if the income from the funds amounts to more than the cost of the professorship the excess will go to the department of pathology to be used for maintenance, equipment and supplies.

WEST VIRGINIA

Cancer Assembly.—The fifth state assembly of the West Virginia Division of the Women's Field Army of the American Society for the Control of Cancer will be held March 2-3 at the Daniel Boone Hotel, Charleston. Among the speakers will be:

Mrs. Harold V. Milligan, national commander (subject not announced).
Dr. Chauncey B. Wright, Huntington, The Diagnostic Tumor Clinic.
Dr. John E. Offner, Weston, state health commissioner, The Cancer Control Division of the State Health Department.
Dr. Walter E. Vest, Huntington, The Function of the Public Health Council.

Mr. J. Louis Neff, Long Island, N. Y., executive director, American Society for the Control of Cancer (subject not announced).

Medical Society Approves Service Plan.—The Kanawha Medical Society has approved the medical-surgical plan now being administered in the Charleston area by Medical Service, Inc. The plan conforms with the basic contract approved for the use of component societies by the fact finding and planning committee of the West Virginia State Medical Association. The resolution formally approving the local plan provides that a committee from Kanawha Medical Society work with the board of directors of Medical Service, Inc., in an advisory capacity and recommends that the fee for medical visits in hospitals be increased to \$3 as soon as it is reasonably possible to do so. The plan now provides a fee of \$2.50 for such visits, which are limited to one each day.

GENERAL

Society News.—The governing board of the American Gastroenterological Association has announced that its annual meeting will be held at the Drake Hotel, Chicago, June 12-13. Dr. J. Arnold Bagen, Rochester, Minn., is the secretary. The American Dietetic Association will hold its twenty-seventh annual meeting at the Stevens Hotel, Chicago, October 17-19.

Fraudulent Salesmen Apprehended.—Two men, Henry Lee Scott and Ramage William Anderson, have been apprehended in Memphis, Tenn., and the records show that Mr. Scott, who weighs 220 pounds and is 58 years old, has operated under the names of R. T. Patterson, R. W. Lee, D. C. Miller, Bob Scott, R. L. Scott and Dr. C. D. Miller. Anderson has used the names of H. A. Johnson and Bill Anderson. They were selling a product alleged to be useful in allergy and claiming to be agents of a widely advertised medicine firm dealing in glandular products.

The Squibb Award.—The E. R. Squibb & Sons Award for 1944, consisting of \$1,000, is now available for assignment to an investigator or investigators in the United States or Canada for an outstanding contribution in endocrinology. Choice of the recipient will be made by the committee of awards of the Association for the Study of Internal Secretions. Nominations should be sent in as soon as possible and should be accompanied by a list of publications (and five reprints if possible) addressed to the secretary of the association, Dr. Henry H. Turner, 1200 North Walker Street, Oklahoma City.

Annual Report of Commonwealth Fund.—Forty-one different pieces of research were supported by the Commonwealth Fund at eleven university schools of medicine and eight other institutions of research rank during the fiscal year ended Sept. 30, 1943, according to its annual report. Three of the forty-one projects were entirely new to the fund during the year; three had been subsidized for ten years or longer, the rest

for periods ranging from one to seven years. Current gifts for the projects amounted to \$395,749. The income of the fund for the year was the smallest since 1936, and appropriations, at a total of \$1,503,124 were the smallest for many years. During the year \$1,555,718.86 was disbursed. Two projects were abandoned because of the loss of key investigators: the study of a diagnostic technic for cancer of the stomach in the department of surgery at Columbia University College of Physicians and Surgeons, New York, and the experimental phases of a study of radioactive phosphorus in the treatment of cancer at the Institute of Radiology, Washington University School of Medicine, St. Louis. Half of the undertakings aided by the fund have a bearing on war medicine. New projects this year included the study of Dr. Max B. Lurie at the University of Pennsylvania School of Medicine in his study of the physiologic factors responsible for differences in resistance to tuberculosis, with inbred rabbits as the test animal; Dr. W. Barry Wood Jr., Washington University, in his study of the physiologic mechanisms responsible for recovery from certain types of pneumonia, and Selman A. Waksman, Ph.D., microbiologist, New Jersey Agricultural Experiment Station, in an intensified investigation of substances recovered or recoverable from the molds, fungi or bacteria which might be useful in the control of pathogenic agents. In the field of medical education only five of the advanced fellowships customarily offered by the fund for junior instructors in medical schools were awarded and only four became effective. The fifth award was an extension of a special fellowship provided for Dr. Fridgeir Olason of the University of Iceland to complete a course of public health study at Harvard University. Assistance to the field of medical education is also reflected in the grants for study of mental health, one of the newer contributions being used to set up a special service at the Payne Whitney Psychiatric Clinic of the New York Hospital for men discharged for psychiatric reasons after induction. A special course for penal psychiatrists at the University of Pennsylvania was abandoned for the time being for lack of candidates. The fund also began a six year series of appropriations to the Long Island College of Medicine to help build up a strong department of psychiatry. The bulk of the psychiatric teaching will be done not in psychiatric wards or clinics but in the medical service, in the belief that "in presenting psychiatry to medical students the subject matter should be continuously oriented to the general practice of medicine rather than to the practice of psychiatry as a specialty." For the past year there have been no Commonwealth Fund fellows from Great Britain or the British commonwealth. Latin American fellowships in medicine and public health, inaugurated two years ago for postgraduate study in the United States, have given every indication of usefulness. Under this plan three men from Argentina, two each from Brazil, Uruguay and Venezuela, and one each from Chile, Colombia, the Dominican Republic, Ecuador, Haiti and Honduras hold appointments for the current academic year. Awards are made with the cooperation of the Pan American Sanitary Bureau. According to the report these Latin American fellows "are well trained, energetic, eager to improve themselves and almost without exception are either holding or preparing to hold positions of responsibility in public health and clinical medicine."

Commenting on its program of assistance to rural hospitals, the report states that the hospitals on the whole are doing well under difficulties. Of the thirteen at work on Jan. 1, 1943 seven had taken in by the end of August, in payment for services rendered, more cash than the total of their operating expenses, and several had accumulated substantial surpluses. Nearly all were comfortably full and some were uncomfortably crowded. In the six older hospitals, taken together, two thirds of the normally available beds were, on the average, continuously occupied, while in the seven newer institutions the percentage of occupancy ranged from 52.5 to 89.6, the optimum in hospitals of this size being in the neighborhood of 65 per cent. Collections ranged from just under 90 per cent in the newest of the hospitals to more than 101 per cent in three of the older ones, indicating that clients were not only meeting their current obligations but paying off old debts. Only one hospital gave as much as 17.5 per cent of its total service to patients unable to pay their own bills, and most of them were able to meet current demands by allocating less than 10 per cent of their services to this group.

War relief accounted for \$390,000, medical education \$34,650 and medical research \$324,462.17. Appropriations covering the division of education, rural hospitals, public health, health studies, mental hygiene, mental hygiene in England, publications, a library and legal research totaled more than \$659,412.12.

Deaths

Bernard Sachs * renowned neurologist, died at his home in the Hotel Plaza, New York, February 8, aged 86.

Dr. Sachs was born in Baltimore Jan. 2, 1858. He received his A.B. at Harvard University in 1878 and his degree in medicine at the Kaiser-Wilhelms-Universität Medizinische Fakultät, Strassburg, Germany, in 1882. He was a postgraduate student with Meynert at Vienna, with Hughlings Jackson at London and with Charcot at Paris from 1882 to 1884, when he returned to New York. In 1885 he became instructor in the New York Polyclinic Hospital and in 1888 professor. Identified as the dean of American neurologists, his career was replete with honors and associations signifying his importance in his chosen specialty, among which were his positions on the staffs of Montefiore, Bellevue and Mount Sinai hospitals, New York. In 1900 he was instrumental in establishing at Mount Sinai the first neurologic division in any voluntary New York hospital, a division he directed until 1924. He was twice president of the New York Neurological Society and of the American

Dr. Sachs had contributed generously to the literature. He was an author of numerous monographs and in 1895 of "Mental and Nervous Disease in Children," in 1926, with Dr. L. Hausman, "Nervous and Mental Disorders from Birth Through Adolescence" and in 1936 "Keeping Your Child Normal."

Lee Wallace Dean * St. Louis, noted otolaryngologist and pioneer in the recognition and treatment of sinus diseases and professor emeritus of otolaryngology, Washington University School of Medicine, St. Louis, died February 9, aged 70, of coronary occlusion.

Dr. Dean was born in Muscatine, Iowa, March 28, 1873. He studied at the State University of Iowa, receiving his degree of doctor of medicine there in 1896. After a year in Vienna he returned to the practice of medicine in Iowa. From 1900 to 1927 Dr. Dean served as professor and head of the department of otolaryngology and oral surgeon at the State University of Iowa, carrying a concurrent appointment from 1912 to 1927 as dean of the medical school. He then went to Washington University School of Medicine, St. Louis, as professor of otolaryngology and subsequently became director in research in otolaryngology at the Oscar Johnson Research Institute. He was once a member of the staffs of the McMillan Eye, Ear and Throat Hospital, Barnes Hospital, St. Louis Children's Hos-



BERNARD SACHS, M.D., 1858-1944

Neurological Association. He was president of the New York Academy of Medicine, professor of clinical neurology at the Columbia University College of Physicians and Surgeons, director of the division of child neurology at the Neurological Institute and chairman, 1916-1917, Section on Nervous and Mental Diseases, American Medical Association. He was also director of child neurology research of the Friedsam Foundation.

In 1931, Dr. Sachs served as the first president of the first International Neurological Congress, a project of which he was a founder and which had been scheduled to be held in Paris in 1914 only to be dissolved by World War I.

In 1942 Mount Sinai Hospital, in tribute to his many years of service in medicine and for his long association with the hospital, held a special ceremony to commemorate his "sixty years' participation in the progress of medicine." A volume of original papers on scientific research specially contributed by noted physicians and scientists was presented to Dr. Sachs as a feature of the occasion. His noted contributions to the field of neurology stemmed from his description in 1887 of the clinical entity of amaurotic family idiocy known as Sach's disease. This condition was named Tay-Sachs disease after Dr. Sachs and Dr. Warren Tay, an English physician who had described the eye condition at about the same time.



LEE WALLACE DEAN, M.D., 1873-1944

pital, St. Louis Maternity Hospital, Jewish Hospital and the otolaryngologist-in-chief to outpatients, University Clinics; serving also as otolaryngologist-in-chief at the McMillan Eye, Ear and Throat Hospital.

Dr. Dean was a member of numerous scientific groups, including the Association of American Peroral Endoscopists, Missouri State Medical Association, American Broncho-Esophageal Association, and La Société de laryngologie des hôpitaux de Paris. He was a member of the board of directors of the American Board of Otolaryngology. He served as president of the Iowa State Medical Society, American Laryngological Association, American Laryngological, Rhinological and Otolological Society, American Otolological Society, American Academy of Ophthalmology and Otolaryngology and secretary of the Section on Laryngology, Otology and Rhinology of the American Medical Association, 1916-1918, and chairman in 1918. He was a commanding officer at General Hospital number 54 during World War I and was a lieutenant colonel in the medical officers reserve corps, retired. In 1937 Dr. Dean was presented with the de Roaldes Gold Medal of the American Laryngological Association. In 1927 he became editor-in-chief of the *Annals of Otolaryngology, Rhinology and Laryngology*, a position he held until death.

James Tayloe Gwathmey ☉ Legion, Texas, a leader in anesthesiology, died in the Veteran Administration Facility, Fayetteville, Ark., February 11, aged 80, of coronary heart disease and bronchial asthma.

Dr. Gwathmey was born in Norfolk, Va., Sept. 10, 1863. His earlier inclinations were toward the ministry, but at Vanderbilt University, Nashville, where he received his degree of doctor of medicine in 1899, his interest turned to medicine. In 1902 Dr. Gwathmey entered the practice of medicine in New York, and he was subsequently a member of the staffs of Trinity and Willard Parker hospitals and consulting anesthetist to the Metropolitan, Knickerbocker and City post-graduate hospitals. At one time he served as a member of the Cancer Institute. He devoted his life to researches which contributed largely to present day usages in operative surgery. At the International Medical Congress in London in 1913 he presented a paper on "An Attempt to Abolish Inhalation Anesthesia." With Dr. Howard T. Karsner, Dr. Gwathmey introduced the method of administering ether and oil orally in preparation for painful dressings for war wounded. In 1923, with Asa B. Davis, he instituted "obstetrical analgesia" at the New York Lying-In Hospital. With Charles W. Hooper he discovered that preliminary medication is equally important with the terminal anesthetic in safeguarding life and preventing lesions of the lung. Dr. Gwathmey was author of one of the most comprehensive and authoritative works in his field, "Anesthesia," published in 1914. In 1922 the American Association of Anesthetists presented him with a silver loving cup inscribed: "Founder and first president of the American Association of Anesthetists for advances in the research, practice and literature of anesthesia, 1912-1922."

William Wilson Pearson ☉ Des Moines; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1893; specialist certified by the American Board of Otolaryngology; member of American Academy of Ophthalmology and Otolaryngology and formerly vice president; member of the American Laryngological, Rhinological and Otolological Society and the Association for Research in Ophthalmology, Inc.; fellow and formerly vice president of the American College of Surgeons; in 1914 organized the Des Moines Academy of Medicine; first president of the Des Moines Medical Library Club in 1912; past president of the Des Moines Academy of Medicine; formerly councilor of the Fifth District of the Iowa State Medical Society; served as a major in the medical corps of the U. S. Army during World War I; lecturer on ophthalmology and clinical ophthalmology at the Drake University College of Medicine from 1902 to 1907 and later professor of ophthalmology and clinical ophthalmology and dean; first All-American football star west of the Alleghenies in 1891; died February 11, aged 74, of cardiovascular disease and myocardial failure.

Daniel Murrah Molloy, White Plains, N. Y.; University of Nashville (Tenn.) Medical Department, 1908; member of the Medical Association of the State of Alabama; a field representative in Central America for the international health division of the Rockefeller Foundation from 1914 to 1940; a medical inspector for the bureau of health of the Philippine Islands for five years; later served with the U. S. Public Health Service as a special expert on malaria and conducted investigations in various parts of the United States; in May 1935 the president of Nicaragua presented him with a letter of gratitude acknowledging his many years of service in connection with public health service of Nicaragua; became president of the Rotary Clubs of Central America in 1936; received degree of doctor of public health from Johns Hopkins University, Baltimore, in 1923; died in the New York Hospital, Westchester Division, January 29, aged 61, of multiple brain infarcts.

Charles H. McCollum, Fort Worth, Texas; Barnes Medical College, St. Louis, 1901; member of the State Medical Association of Texas; fellow of the American College of Surgeons; veteran of the Spanish-American War; formerly professor of therapeutics and pharmacology, Fort Worth School of Medicine, Medical Department of Texas Christian University; served as city and county health officer; chief of staff of St. Joseph's Infirmary in 1925 and senior surgeon for many years; visiting surgeon at All Saints Episcopal Hospital and the Harris Memorial Methodist Hospital; consulting gynecologist at the City and County Hospital; for many years served on the board of trustees of the Trinity University, Waxahachie; died in a Fort Worth hospital December 2, aged 69, of acute cardiac failure.

Edward Peirson Richardson ☉ Brookline, Mass.; Harvard Medical School, Boston, 1906; John Homans professor of surgery emeritus at his alma mater and the graduate school; member of the American Surgical Association, Southern Sur-

gical Association, Society of Clinical Surgery and the New England Surgical Society; fellow of the American College of Surgeons; served with the British Expeditionary Forces in 1915 and later as captain and major in the medical corps of the U. S. Army in France and Germany; author with Dr. J. H. Means of "Diagnosis and Treatment of Diseases of the Thyroid," published in 1939; honorary member of staff, Massachusetts General Hospital; died in the Phillips House of the hospital January 26, aged 62, of coronary thrombosis.

Sadie Bay Adair, Chicago; John A. Creighton Medical College, Omaha, 1902; member of the Illinois State Medical Society and the American Medical Women's Association; at one time a member of the Chicago Board of Education; formerly on the medical staff of the City of Chicago Municipal Tuberculosis Sanitarium and director of the Frances Juvenile Home; editor for twenty-five years of the *Official Bulletin of the American Medical Women's Association, Inc.*, Branch number 2; died January 16, aged 70, of uremia.

Hjalmar Ahlstrom, Worcester, Mass.; Tufts College Medical School, Boston, 1911; died January 12, aged 80.

William R. Arthur, Kinloch, Mo.; Howard University College of Medicine, Washington, 1890; served as a first lieutenant in the medical reserve corps of the U. S. Army during World War I; served as postmaster of Kinloch and Brooklyn, Ill.; formerly on the staff of the Missouri State Penitentiary Hospital, Jefferson City, and chief of staff of St. Mary's Infirmary, St. Louis, where he died December 17, aged 75, of hypertensive cardiovascular disease.

Fernando Basanez, Corpus Christi, Texas; Universidad Nacional Facultad de Medicina, Mexico, D. F., 1919; at one time associated with the Bexar County Health Department; served as secretary of the Texas Radiological Society in 1941 and 1942; died November 8, aged 48, of pulmonary tuberculosis.

John Carlind Browne, New York; McGill University Faculty of Medicine, Montreal, Que., Canada, 1918; served as a major in the Canadian Army during World War I; instructor in medicine from 1922 to 1926 and associate in medicine from 1926 to 1938 at the New York Post-Graduate Medical School; on the staffs of the Manhattan General and St. Vincent's hospitals; died January 6, aged 50.

Leigh Buckner ☉ Roanoke, Va.; University of Maryland School of Medicine, Baltimore, 1885; on the staff of the Roanoke Hospital; died December 25, aged 82.

James Huston Carrico, Portland, Ore.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1902; member of the Oregon State Medical Society; died in the Portland Sanitarium and Hospital December 22, aged 73, of carcinoma of the stomach.

Jonas Clark, Gilroy, Calif.; Harvard Medical School, Boston, 1875; fellow of the American College of Surgeons; member of the California Medical Association; formerly health officer; at one time superintendent of the Santa Clara County Hospital, San Jose; on the staff of the Wheeler Hospital, where he died December 30, aged 90, of pneumonia following a fall and an old cardiac valvular lesion.

Olive L. Clarke, Los Angeles; Woman's Medical College of Pennsylvania, Philadelphia, 1895; died recently, aged 72.

John W. Conklin, Leitchfield, Ky.; Hospital College of Medicine, Louisville, 1882; member of the Grayson County Board of Health; died November 10, aged 85, of senility.

James Homer Cook, New Carlisle, Ohio; Pulte Medical College, Cincinnati, 1883; died in the Springfield City Hospital, Springfield, December 31, aged 87, of carcinoma of the prostate.

Joseph Calhoun Darracott ☉ Maria, Texas; University of Texas School of Medicine, Galveston, 1905; first president of the Pecos-Jeff Davis-Presidio-Brewster Counties Medical Society; served as city and county health officer; a lieutenant in the medical corps of the U. S. Navy during World War I; recently an examiner of selectees and chairman of the procurement and assignment advisory committee for Pecos, Jeff Davis, Presidio and Brewster counties; died November 27, aged 63, of coronary occlusion.

Lucien Emil Demke, Belcourt, N. D.; Loyola University School of Medicine, Chicago, 1926; served during World War I; appointed a deputy state health officer to act on the reservation where he was an Indian Service physician; died in Leland, Ill., recently, aged 46, of coronary thrombosis and malignant hypertension.

William Burns Donaldson, Polo, Ill.; Chicago Medical College, 1882; died in Elgin December 19, aged 90, of senility.

James Michael Donelan ☉ Glenwood, Iowa; College of Physicians and Surgeons of St. Joseph, Mo., 1882; served on the board of health, library board, as sheriff and county coroner; died December 23, aged 83, of coronary occlusion.

Joseph Alexander Edgar ☉ Jersey City, N. J.; Columbia University College of Physicians and Surgeons, New York, 1906; died in the Christ Hospital December 30, aged 63, of epithelioma of the hand from x-ray burns and of hemorrhage from the axilla.

Elmer A. Drolshagen ☉ Algonac, Mich.; Detroit College of Medicine and Surgery, 1917; formerly medical examiner of Wayne County; served during World War I; on the staff of St. Mary's Hospital, Detroit; died in the Harper Hospital, Detroit, January 14, aged 50, of pernicious anemia and spastic colitis.

Henry William Edwards, Rochester, N. Y.; Harvard Medical School, Boston, 1915; served during World War I; died January 9, aged 55, of poison, self administered.

William G. Evans, Ellwood City, Pa.; Starling Medical College, Columbus, 1898; on the staff of Ellwood City Hospital; died recently, aged 74, of cerebral hemorrhage.

Edgar Lee Gardner, St. Joseph, Mo.; Central Medical College of St. Joseph, 1903; served during World War I; died December 13, aged 61, of pulmonary tuberculosis.

William B. Gnagi Sr. ☉ Monroe, Wis.; Rush Medical College, Chicago, 1893; on the staff of St. Clare Hospital; died November 6, aged 73, of carcinoma of the liver.

George W. Hayman, Little Rock, Ark.; Meharry Medical College, Nashville, Tenn., 1893; died December 28, aged 78, of arteriosclerosis.

Mark Brownson Hilts, Sloan, Iowa; Rush Medical College, Chicago, 1886; served as mayor of Sloan and member of the school board; died in Sioux City December 23, aged 84, of coronary occlusion.

James R. Grave McLaughlin, Oklahoma City; University of Oklahoma School of Medicine, Oklahoma City, 1911; member of the Oklahoma State Medical Association; served as county physician; on the staffs of the Oklahoma City General Hospital, Wesley Hospital and St. Anthony Hospital, where he died December 26, aged 59, of coronary occlusion.

Nikolas Frederic Mirabile, Garfield, N. J.; Medical College of the State of South Carolina, Charleston, 1920; died in the Passaic General Hospital, Passaic, December 26, aged 58, of influenzal pneumonia and acute myocarditis.

Charles Lloyd Moore, Charlottesville, Va.; University College of Medicine, Richmond, 1897; a captain in the medical corps of the U. S. Army during World War I; died December 8, aged 68, of arteriosclerosis.

Ferris Albert Niles, Crab Orchard, Tenn.; Chattanooga Medical College, 1896; served during World War I; died in the Chamberlain Memorial Hospital, Rockwell, December 15, aged 69, of strangulated inguinal hernia and pneumonia.

William H. Oatway Sr., Waukesha, Wis.; Milwaukee Medical College, 1897; member of the State Medical Society of Wisconsin; past president of the Waukesha County Medical Society; served on the state draft board of appeal during World War I; died January 2, aged 73, of carcinoma of the liver.

Harry Clayton Povey, Newark, N. J.; Baltimore Medical College, 1905; died December 10, aged 59, of carcinoma of the lung and chronic myocarditis.

Charles Cooper Rankin, Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1895; member of the Medical Society of the State of Pennsylvania; died in the Chester County Hospital, West Chester, recently, aged 71, following an operation for peptic ulcer.

Horace Eddy Robinson ☉ Pleasantville, N. Y.; Tufts College Medical School, Boston, 1912; a lieutenant in the medical corps of the U. S. Army during World War I; chief of the division of contagious diseases, past chairman of the medical board and past president of the attending medical staff, Grasslands Hospital, Valhalla; for many years on the staff

of the Babies Hospital, New York, and the Northern Westchester Hospital, Mount Kisco; died January 11, aged 56, of cerebral hemorrhage.

Robert Nathan Rogers, Oxford, N. Y.; University of Louisville (Ky.) Medical Department, 1907; at one time a druggist; died in Sidney January 1, aged 58, of coronary occlusion.

Michel M. Saliba ☉ Wilson, N. C.; Baltimore Medical College, 1897; a founder, first president and formerly councilor of the Fourth District Medical Society; served during World War I; major, medical reserve corps, U. S. Army, not on active duty; a charter member, past president and secretary of the Rotary Club; a member of the chamber of commerce; died in Savannah, Ga., January 5, aged 68, of heart disease and uremia.

George Addison Silver ☉ Hightstown, N. J.; University of the City of New York Medical Department, New York, 1881; died January 7, aged 82, of cerebral hemorrhage.

John Pugh Smallwood ☉ Falls Church, Va.; University of Maryland School of Medicine, Baltimore, 1885; on the courtesy staff, Arlington Hospital, Arlington; died January 4, aged 78, of chronic myocarditis.

Philip Smith, New York; Columbia University College of Physicians and Surgeons, New York, 1900; formerly assistant clinical professor of neurology at the Long Island College Hospital; member of the American Psychiatric Association; chief medical inspector for the department of mental hygiene of the state of New York; served overseas as a major in the medical corps of the U. S. Army during World War I; died in the Brooklyn State Hospital January 9, aged 71, of pneumonia and heart disease.

Albert Stern, Woodside, N. Y.; Medizinische Fakultät der Universität Wien, Germany, 1927; member of the Medical Society of the State of New York; on the staff of Queens General Hospital, Jamaica; died in the Boulevard Hospital, Long Island City, January 6, aged 41, of acute leukemia.

John Wright Straight, Santa Ana, Calif.; Omaha Medical College, 1891; died in St. Joseph Hospital, Orange, December 25, aged 75, of coronary thrombosis.

Albert Ernst Taussig, St. Louis; Washington University School of Medicine, St. Louis, 1894; professor emeritus of clinical medicine at his alma mater; member of the Association of American Physicians; specialist certified by the American Board of Internal Medicine; served on the staffs of the Barnes, Jewish and St. Mary's

hospitals; died January 16, aged 72, of carcinoma of the colon with metastasis to liver and lungs.

Wright B. Taylor, Weldon, Texas (licensed in Texas under the Act of 1907); on the staff of the Eastham State Farm; died recently, aged 65.

CORRECTION

Died While in Military Service.—The death of Lieut. Rowland William Hall Jr., Clinton, Mass., was erroneously reported in THE JOURNAL, February 12, page 457. A telegram from the Surgeon General's Office, Washington, D. C., reads "Due to similarity in name Lieut. Rowland William Hall Jr., medical corps, inadvertently reported dead."

KILLED IN ACTION

John Dallas Greathouse, Minneapolis; University of Minnesota Medical School, Minneapolis, 1940; commissioned lieutenant (jg) medical corps, U. S. Naval Reserve, on March 10, 1941 and a lieutenant on June 15, 1942; posthumously awarded Order of Purple Heart; aged 29; officially reported as missing in action as of May 7, 1942, serving aboard the U. S. S. *Neosho* when the vessel was lost as the result of an enemy bombing attack in the Southwest Pacific; officially declared dead May 8, 1943 by the U. S. Navy Department.



LIEUT. JOHN D. GREATHOUSE (MC),
U.S.N.R., 1914-1943

Bureau of Investigation

TWO FRAUDULENT "BUST DEVELOPERS"

Mrs. Richman's Estrol Cream

A Matilda Richman, trading under the names Mrs. M. Richman and Estrol Company, sold "Estrol Cream" through the mails from Brooklyn. The Post Office Department's investigation revealed that she exploited her nostrum under the claim that it would overcome and remove the cause of flat, undeveloped breasts by restoring to normal functioning the endocrine glands which produce the hormones essential to proper breast development. To give her product the semblance of a scientific discovery, she claimed: "Members of the medical profession have now found a cream containing certain estrogenic substances which is doing wonders where estrogenic substances are needed . . . Some women require but one jar, while others require several. Don't be disappointed at the first trial. Very often the second or third will do the trick. In certain rare cases, more are required . . . It is a harmless, scientifically prepared cream." There were, of course, the usual testimonial letters, but with the added explanation: "Because of the extremely personal nature of this product, we cannot, of course, give you the full names of these people."

When Mrs. Richman was ordered to show cause why a fraud order should not be issued against her business, a government chemist appearing as a witness for the Post Office Department at the hearing testified that his chemical analysis of a jar of Estrol Cream purchased through the mails from Mrs. Richman showed that it contained petrolatum, hydrous wool fat, peanut oil, water and stilbestrol. The label declared the presence of 5 mg. of stilbestrol in the 2 ounce jar.

Another government witness, a medical officer in the United States Navy and an expert in endocrinology, particularly in relation to diseases of the breast, testified as to the structure and functions of this organ. Among other things, he showed that small breasts are common to certain women and that their size may be the result of diseases and abnormal physical conditions, particularly those affecting the endocrine glands; that only about 5 per cent of the women with small breasts are in that condition as a result of a deficiency of estrogenic substances, and that the small size may even be caused by too much estrogen in the person. Hence, he said, there is no single type of treatment which could be uniformly used, or any particular drug, or daily dosage thereof, which could be uniformly prescribed as a corrective measure for all cases of small breasts.

The witness further testified that the product in question contained no ingredient besides stilbestrol which would have any effect on the breast, and that though the amount of it present in Estrol Cream might slightly increase the size of the nipple and the thickness of the skin around it, as well as the connective tissue immediately around the ducts, and cause a dilatation of said ducts, effecting a swelling thereof, this condition would be only temporary and the breasts would regress even under continued treatment. Further, he declared that the daily dosage of Estrol Cream as prescribed in the directions included only 1/4 mg. of stilbestrol, which, he said, was far less than the ordinary dosage and so was hardly likely to have any effect. The respondent claimed that this expert medical witness had admitted that a 3 inch development of the breasts was possible through the use of less than one full jar of Estrol Cream, but the physician replied that such result was entirely improbable and bordered on the impossible.

Although the respondent was given every opportunity to introduce expert medical testimony in her behalf, and there was even an adjournment of the hearing to make this possible for her, such testimony was not finally introduced. The respondent did, however, attempt to present medical journals and books and other evidence, all of which were clearly inadmissible under the law of evidence.

The respondent challenged the jurisdiction of the Post Office Department over the subject matter of this case, but this was overruled, since the statutory jurisdiction of the Department

over such cases has been upheld by the highest courts of the land on many occasions.

Finally, it was found that the respondent was engaged in conducting a scheme for obtaining money through the mails by means of false and fraudulent pretenses, representations and promises, and a fraud order was issued Aug. 31, 1943 against the names Estrol Company, Matilda Richman and Mrs. M. Richman. In this connection it is of interest that on May 22, 1942 the Post Office Department had issued a fraud order against another mail-order scheme of Matilda Richman, which she operated under the names Hairtone Company and Marvel Company in selling "Quinine Hair Marvel" through the mails as an alleged hair grower and dandruff cure.

Another from Brooklyn—Form-Aid Cream

"Form-Aid Cream" was sold through the mails from Brooklyn under the trade style "Form-Aid." When the Post Office Department, after due investigation of the scheme, addressed to this firm name a memorandum of the charges of fraud, accompanied by a letter, the receipt for this material was signed "Ethel Kahan, Owner." The hearing of the case was held Sept. 16, 1943, after a postponement had been granted the respondent, who was represented by a Brooklyn attorney. The latter was given an additional period to submit a brief, and this proposed that the case be disposed of by means of the respondent's affidavit agreeing to discontinue the business. This, however, the Post Office Department would not accept.

That department's investigation revealed that Form-Aid Cream, when used in conjunction with certain exercises, was represented to bring any undeveloped or sagging bust to a full and shapely size, any scrawny neck to a beautiful and attractive condition, and unshapely limbs to a comely state, regardless of the user's age or physical condition. Apparently the cream was not always uniform in composition, for a government chemist testified at the hearing that his analysis showed the contents of one jar to consist of 86 per cent of petrolatum, 14 per cent of hydrous wool fat, and a faint perfume, whereas examination of a specimen showed it to contain nothing but petrolatum.

Also testifying for the Post Office Department was a physician in government employ who discussed the structure and functions of the female breast and its occasional abnormalities, particularly as to size. He expressed the opinion that Form-Aid Cream would be absolutely worthless for developing any breast, filling out a scrawny neck or making unshapely limbs attractive, even in connection with the massage recommended by the promoter, since such massage did not cause absorption of the petrolatum, and any hydrous wool fat that might be absorbed would not be localized in the breasts, but distributed throughout the body by means of the blood stream, and would be handled by the system like fat that is absorbed from the inter-

NEW BUST CREAM FOR WOMEN



HERE'S GOOD NEWS FOR MANY WOMEN
WITH FLAT, UNDEVELOPED BUSTS!

Many women who are embarrassed and worried about flat, undeveloped busts because they make them look mannish and lack sex appeal will be happy to know about this new discovery. Members of the Medical profession

have now found that a cream containing certain estrogenic substances which are doing wonders in cases where estrogenic substances are needed. If you are embarrassed by a flat, undeveloped bust send your name and address to Mrs. M. Richman, 336 Adams St., Dept SF10 B'klyn, N. Y. you will receive full information in a plain envelope. No charge is made for the information on the new Estrol cream.

DOES YOUR BUST
LACK NORMAL GROWTH AND SIZE
DUE TO LACK OF SUFFICIENT
ESTROGENIC SUBSTANCES?

Try ESTROL CREAM
Satisfaction-Guaranteed or Money-Back

ONLY \$2 Complete directions with every package. Shipped in plain wrapper. Send \$2 to Mrs. M. Richman, 336 Adams St., B'klyn, N. Y. (Dept SF10)

ESTROL COMPANY
336 Adams St., B'klyn, N. Y.

Adjoining advertisements of Estrol Cream in a farm journal. Note that one gives the promoter as Mrs. M. Richman and the other as the Estrol Company, and that even the key numbers are not identical.

tines. He further showed that the exercises recommended to accompany the use of the cream would not improve scrawny necks or unshapely limbs.

Accordingly, the enterprise was found to be a scheme for obtaining money through the mails by means of false and fraudulent representations and promises, and a fraud order debarring it from the mails was issued Nov. 13, 1943, against Form-Aid and its officers and agents.

MISBRANDED PRODUCTS

Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the Federal Security Agency

[EDITORIAL NOTE.—These Notices of Judgment are issued under the Food, Drug and Cosmetic Act and in cases in which they refer to drugs and devices they are designated D. D. N. J. and foods, F. N. J. The abstracts that follow are given in the briefest possible form: (1) the name of the product; (2) the name of the manufacturer, shipper or consignee; (3) the date of shipment; (4) the composition; (5) the type of nostrum; (6) the reason for the charge of misbranding, and (7) the date of issuance of the Notice of Judgment—which is considerably later than the date of the seizure of the product and somewhat later than the conclusion of the case by the Food and Drug Administration.]

Bevimln, or Bevimln Vitamin B₁ Hydrochloride.—Loeser Laboratory, Inc., New York. Shipped June 29, 1939. Adulterated because strength differed from and quality fell below the representation on label "Each cc. = 10 MG. = 3000 I.U." (of vitamin B₁) and (on carton) "Each cc. contains 10 Mg. (3,000 I.U.)" (of vitamin B₁), whereas it contained a smaller amount. Misbranded because the aforesaid statements on label and carton were false and misleading.—[D. D. N. J., F. D. C. 680; February 1943.]

Bronchi-Lyptus.—Bronchi-Lyptus Laboratory, Los Angeles. Shipped Sept. 3, 1940. Composition: essentially oil of eucalyptus, with a gum, glycerin, sugar and water. Misbranded because name of product and certain label statements variously suggested that the mixture was an efficacious treatment for all throat and bronchial disorders, would correct indigestion in the stomach, and was accepted by all nose and throat specialists. Further misbranded because label did not accurately state quantity of contents.—[D. D. N. J., F. D. C. 727; April 1943.]

Cal-Par (Dr. Parrish's 7 Day Reducing Plan).—Hood Products Corporation, New York. Shipped May 10 and 14, 1941. Composition: Microscopic examination showed wheat germ, wheat bran, crystalline material and wheat flour. Chemical examination showed calcium, phosphorus, iron salts and sugar. Adulterated because strength differed from and quality fell below that which it was represented to possess, namely, 1.8 Gm. of phosphorus per 2 heaping teaspoonsful. Misbranded because of following false and misleading label representations: That it would supply the average person's daily need of phosphorus, build strong teeth, sturdy bones, firm flesh, pliant muscles and efficient brain cells; that it was an aid for underweight and for reducing overweight, would protect the user against nervousness, tiredness, sleeplessness and lack of "pep" and vigor; that it would prevent heart trouble, nervous disorders, kidney complaints, liver ailments, digestive upsets, eye afflictions and many other disorders due to lack of certain vitamins and minerals; that it would aid in maintaining the acid-base equilibrium of the blood and furnish nourishment to nerves and brain, constituted an adequate treatment in anemia, run-down conditions and sinus trouble, and would relieve the pains of arthritis and rheumatism.—[D. D. N. J., F. D. C. 677; February 1943.] Adulterated and misbranded also under the provisions of the law applicable to foods as reported in F. N. J. 3648.

Castoria.—George Crompton and Charles Crompton and Sons, Inc., Lynn, Mass. Shipped Dec. 4 and 5, 1940. (This is not the widely advertised "Fletcher's Castoria.") Composition: sugar, alcohol, water, methyl salicylate, oil of anise, Rochelle salt and plant extractives, including senna. Misbranded because falsely represented on label to be a remedy for regulating stomach and bowels, especially useful in convulsions, colic, feverishness, diarrhea, sour stomach, worms, and loss of sleep, and to aid digestion and promote rest.—[D. D. N. J., F. D. C. 682; February 1943.]

Chek-A-Cold.—Hance Bros. & White, Inc., Philadelphia. Shipped March 13, 1942. Composition: essentially extracts of plant drugs, including an alkaloid-bearing substance, with a small amount of tartar emetic, chloroform (0.97 minim per fluid ounce), alcohol, sugar and water. Misbranded because of false and misleading suggestions in the designation "Chek-A-Cold" and incorrect label declaration of chloroform content.—[D. D. N. J., F. D. C. 734; April 1943.]

Colloidal Dextro Calcium Bleything.—Bleything Laboratories, Los Angeles. Shipped between Oct. 17, 1940, and July 2, 1941. Misbranded because label recommendations were false and misleading in giving the impression that the product would supply the user with sufficient calcium to be of value in cases of ordinary or even pronounced calcium deficiency. Also misbranded because label declaration of sodium benzoate content was incorrect.—[D. D. N. J., F. D. C. 717; April 1943.]

Coroco Vitamins A-B₁-G-D Capsules.—International Vitamin Corporation, New York. Shipped May 25, 1940. Composition: each capsule was represented to contain 50 international units of vitamin B₁ and 1,000 U. S. P. units of vitamin D, whereas examination showed that each capsule contained less than 12.5 international units of vitamin B₁ and not more than 850 U. S. P. units of vitamin D; hence adulterated. Misbranded because falsely represented to furnish "moderate amounts" of vitamins B₁ and G when taken in the dosage of one capsule per day as directed. [D. D. N. J., F. D. C. 681.] Also adulterated and misbranded under the provisions of the law applicable to foods, as reported in F. N. J. 3425.

Crompton's Liniment.—George Crompton and Charles Crompton and Sons, Inc., Lynn, Mass. Shipped Dec. 4 and 5, 1940. Composition: a fatty oil, with such volatile oils as camphor, methyl salicylate and probably eucalyptol. Misbranded because of false and misleading label representations that it would be efficacious in treatment of rheumatic pains, numbness of limbs, contraction of muscles, pains in the side, chest and back, hoarseness, sore throat, quinsy, and common and severe cases of headache. Further misbranded because fabricated from two or more ingredients and label did not give the common or usual name of each.—[D. D. N. J., F. D. C., 682; February 1943.]

Dr. Gordshell's Salve.—Gordshell Chemical Company, Baltimore. Shipped Sept. 23, Oct. 17 and Nov. 28, 1941. Composition: fatty, waxy and resinous materials containing volatile oils and a trace of alkaloid. Misbranded because of false and misleading statement on label and carton, "Contains: Stramonium Alk. .05%", since product contained not more than 0.002 per cent, if any, of stramonium alkaloids. Further misbranded because of false and misleading label representations that product was efficacious for skin irritations and boils, and that its ingredients possessed unusual properties for promoting healing. Also misbranded because label failed to give common or usual name of each active ingredient, since declaration "Contains: Stramonium Alk. .05%, Oil of Sassafras, Elder Flowers, Bayberry, Rosin, Beeswax, in a Suitable Base" was not a true statement of the active ingredients.—[D. D. N. J., F. D. C. 686; February 1943.]

Individual Quinine Hair Treatment.—Joseph Daigneault, Malone, N. Y. Shipped June 3, 1940. Composition: Tube No. 1, essentially mineral oil, a small amount of a fatty oil, and carbolic acid; Tube No. 2, essentially soap and water. Bacteriologic tests showed that the treatment was not antiseptic. Adulterated because strength differed from, and purity or quality fell below, that which it was represented to possess, namely, "antiseptic"; also misbranded for that reason and because product was represented to be efficacious for the purposes recommended and because label did not carry an accurate statement of the quantity of contents, common or usual names of active ingredients or correct name and address of the manufacturer, packer or distributor.—[D. D. N. J., F. D. C. 679; February 1943.]

Life Line Tonic.—John B. Kori, trading as United States Remedy Company, Jacksonville, Fla. Shipped Oct. 17, 1940. Composition: a water-glycerin solution containing large amounts of epsom salt and smaller ones of sodium sulfate, sodium phosphate, quinine, iron, caffeine, saccharin and plant extractives, including emodin. Misbranded because of false and misleading label representations that product would be efficacious in treating sour stomach, biliousness, colic, cramps due to gas, and temporary listlessness; would be beneficial in malarial and feverish conditions due to chills and colds; would check chills and malarial fever, build resistance, and be efficacious in treating colds, stuffiness of nasal passages, simple headache, neuralgia, and malarial fever; would help keep the system clean and invigorated, and generally relieve within a few hours the distress and misery of common colds; would not be habit forming; was a tonic and possessed value as a treatment, in emergencies, as suggested by the name "Life Line." Further misbranded because fabricated from two or more ingredients and label did not give common or usual name of each, including quantity, kind and proportion of alcohol present. Also misbranded because label falsely represented that product contained boneset, iron and ammonium citrate and citric acid in therapeutically important amounts.—[D. D. N. J., F. D. C. 683; February 1943.]

SMH Pur-Erb Compound No. 1 and Helena Pur-Erb Special No. 3.—James M. Odell, trading as Home Treatment Service, Pur-Erb Products and Herbal Health Products, Chicago. Shipped Dec. 17, 1940. Composition: first-named product consisted essentially of extracts of plant drugs, including laxatives such as aloes, senna and cascara sagrada, and water; second-named product consisted essentially of plant drugs, solid plant material and water. SMH Pur-Erb Compound misbranded in that label directions were indefinite as to amount; that label failed to give adequate warning against unsafe methods or duration of administration, particularly to caution that frequent or continued use might result in dependence on laxatives; that label suggested that product was efficacious in treatment of chronic constipation, was a health prescription and would improve the general health; that it was an adequate remedy for constipation and colitis, and that it was effective in treating serious, stubborn, obstinate or severe cases of constipation or colitis. Further misbranded in that certain information that the Act requires on label was not so placed thereon as to make it intelligible to the ordinary reader, since much of it was stated in German, Polish and Lithuanian, and there was no accurate statement, even in these foreign languages, of the quantity of contents in terms of measure, or common or usual name of each active ingredient. "Helena" Pur-Erb Special No. 3 misbranded in that label failed to give adequate directions for use and limitation as to frequency and duration of use. Also misbranded because of false representations in the name "Rx Kid-Ne Herb Compound" and statements representing product as an efficacious treatment of diseased kidney, sluggish conditions of genito-urinary system and all human ills. Further misbranded because made from two or more ingredients and label did not properly declare these under their common or usual names, or give quantity of total contents in terms of measure.—[D. D. N. J., F. D. C. 662; February 1943.]

Correspondence

SPREAD OF INFANTILE PARALYSIS

To the Editor:—The title of your editorial of Dec. 4, 1943, "The Modes of Spread of Infantile Paralysis," seemed a priori to be particularly well chosen for discussing Maxcy and Howe's "The Significance of the Finding of the Virus of Infantile Paralysis in Sewage: A Review" (to be published). It would appear futile in the light of our present knowledge of the natural history of the disease to insist on a "unitarian" theory of spread. The promise of the title, however, seemed to us to fall short of fulfilment.

It is stated in the editorial that "the virus can live only a short time in sewage so far as known now and that there is no likelihood of its surviving the passage through water purification plants." Although it is not possible to say at present if virus in sewage constitutes a link in the infection chain or not, nevertheless it has been found hardy enough to survive various laboratory manipulations taking from one to three days preparatory to inoculation (Paul, J. R.; Trask, J. D., and Gard, Sven: Poliomyelitis Virus in Urban Sewage, *J. Exper. Med.* 71:765 [June] 1940. Unpublished results obtained by the Yale Poliomyelitis Study Unit). Indeed, samples of sewage have on occasion been kept at 7 C. up to eighteen days and have been found to contain virus. Virus has been recovered, moreover, from the effluent of one Chicago disposal plant (unpublished results just cited. It should be emphasized that treatment at this plant is mild, being settling of solids, followed by discharge of the effluent, and digestion of the solids in Imhoff tanks). The detection of virus in two successive tests from a New York sewage plant fifteen, and from a Chicago sewage plant seventeen days apart (unpublished results) would indicate that even if virus is destroyed rapidly in this medium it may be as rapidly replaced.

As to the statement that there is "no likelihood of its [the virus] surviving the passage through water purification plants," there is not enough evidence available to say whether or not virus is stable enough to survive water treatment. Although all laboratory experiments with monkey adapted or rodent strains of virus are admittedly unnatural, they may offer leads as to what takes place in nature. It has been found that a low concentration of residual chlorine destroys a fixed amount of Theiler's mouse poliomyelitis virus, but this same amount of virus in the presence of extraneous organic matter survives more than ten times this amount of residual chlorine (unpublished results).

With regard to the possibility of virus entering water supplies from contaminated sewage, the evidence against poliomyelitis being a water borne disease is set forth and on this basis the conclusion is stated that the presence of the "virus of infantile paralysis in sewage is without significance as far as the general spread of the disease is concerned." Although it is not clear how virus may travel from sewage—if indeed it ever does—to the susceptible human being, it would appear the part of wisdom to consider, in addition to water, other possible agents such as certain forms of insect, avian and mammalian life which may come into contact with both sewage and man. The arguments quoted against flies as playing a role in the transmission of the disease are (1) "Flies are not invariably associated with the disease" and (2) "the disease would not 'attack children preponderantly, as is the case, were it transmitted primarily by

the fly or any other insect.'" To be sure flies are not invariably associated with the disease, as in winter poliomyelitis (Ward, Robert, and Sabin, A. B.: The Presence of Poliomyelitis Virus in Human Cases and Carriers During the Winter, *Yale J. Biol. & Med.*, to be published). Concerning the second argument, one would expect just such a high incidence in children if adults were immune because of infection—preponderantly abortive or nonparalytic—acquired in childhood, or immunity acquired by other, as yet unrecognized, means. Analogies obtain in such insect borne diseases as yellow fever and dengue where, although epidemics have occurred either among susceptible newcomers to endemic regions or among the nonimmune populations of newly invaded localities, nevertheless most adult natives of endemic regions are immune, probably because of unrecognized childhood infections (Simmons, J. S.: Insects as Vectors of Virus Diseases, in *Virus and Rickettsial Diseases*, Harvard University Press, 1940, p. 145). Although it is true that in epidemics of summer arthropod borne encephalitis as the western equine and St. Louis types adults are chiefly affected, conditions of exposure may be a factor; in the one recorded outbreak (Massachusetts, 1938) of eastern equine encephalomyelitis, 70 per cent of the cases occurred in children under 10 years of age. It should not be forgotten that of 24 batches of flies trapped in various parts of the continent (from New Brunswick, Canada, Connecticut, Ohio, Alabama, Georgia and Texas) within ten days of the onset of the last case of poliomyelitis in a given locality and tested in cynomolgus monkeys, thirteen yielded the virus, and in one case the number of flies carrying a monkey paralyzing dose was found to be as few as fourteen (Paul, J. R.; Trask, J. D.; Bishop, M. B.; Melnick, J. L., and Casey, A. E.: The Detection of Poliomyelitis Virus in Flies, *Science* 94:395 [Oct. 24] 1941. Sabin, A. B., and Ward, Robert: Flies as Carriers of Poliomyelitis Virus in Urban Epidemics, *ibid.* 94:590 [Dec. 19] 1941. Trask, J. D.; Paul, J. R., and Melnick, J. L.: The Detection of Poliomyelitis Virus in Flies Collected During Epidemics of Poliomyelitis: I. Methods, Results and Types of Flies Involved, *J. Exper. Med.* 77:531 [June] 1943). The probability of obtaining virus from flies trapped in epidemic areas would appear to be as good as that of obtaining it from stools collected in the acute stage of the disease and certainly better than that of finding it in nasopharyngeal washings.

Contact infection is admittedly a means of spreading infantile paralysis, but that it is the "most important means" has not been proved to our satisfaction. The phenomenon of seasonal incidence which has been stressed by Paul (The Epidemiology of Poliomyelitis, in *Infantile Paralysis*, Waverly Press, Inc., 1941, p. 133; Poliomyelitis, in *Harvey Lectures 1942-43*, to be published) is not explained by contact infection. Furthermore, if may be significant that in certain localities outbreaks of summer arthropod borne encephalitis have occurred simultaneously with poliomyelitis (Donovan, C. R., and Bowman, Maxwell: Some Epidemiological Features of Poliomyelitis and Encephalitis, Manitoba, 1941, *Canad. Pub. Health J.* 33:246 [June] 1942. Buss, W. C., and Howitt, Beatrice, F.: Human Equine Encephalomyelitis in Kern County, California, 1938, 1939 and 1940, *Am. J. Pub. Health* 31:935 [Sept.] 1941).

The editorial goes on to say that "everything in human power must be done to prevent contact infection. Unquestionably there is need now for closer isolation than has been carried out in the past." If indeed it were desirable to do these things—and there is no evidence that such procedures would control poliomyelitis—may we ask how, with our present methods of diagnosis, is it possible to prevent contact infection by closer isolation when for every confined paralytic case 10 or more

The work carried out in the laboratory of the Yale Poliomyelitis Study Unit has been aided by a grant from the National Foundation for Infantile Paralysis.

abortive or inapparent cases are estimated to be in circulation? In this connection we should recall that once it was common practice to place poliomyelitis patients in open wards together with other patients. The rarity of hospital infection from patient to patient and from patient to hospital personnel would militate against the philosophy of greater segregation as a solution or even as an aid to the problem. Indeed, no one has yet demonstrated that the closing of schools, theaters and other gathering places, such as bathing beaches, has in any way altered the course of an epidemic. It is a striking fact that in the fall, when schools open and chances for contact infection become greater among children, epidemics of infantile paralysis fade away.

Our aim in this communication is not to make a plea for sewage or flies as vehicles in the transmission of the disease but to point out that contact infection has not been demonstrated to be the "most important means" of spreading poliomyelitis. We believe that it is wise to keep our minds receptive to evidence which eventually may show other "modes of spread of infantile paralysis" more in keeping with our present knowledge of the natural history of the disease.

ROBERT WARD, M.D.

JOSEPH L. MELNICK, PH.D.

Yale Poliomyelitis Study Unit, Section of Preventive
Medicine, Yale University School of Medicine.

To the Editor:—The editorial entitled "The Modes of Spread of Infantile Paralysis" (THE JOURNAL, Dec. 4, 1943) merits a word of reply from more than one corner of the world. This particular reply, however, is not presented in the form of a rebuttal, for the subject under discussion is not one for debate, and no amount of argument can yet make up for our present lack of factual information on the modes of spread of infantile paralysis.

The writer of this editorial, which is based on Maxcy and Howe's paper to be published in the *Sewage Works Journal*, leaves the impression that these authors have been more or less didactic in their statements about the spread of poliomyelitis. Thus, in connection with the demonstration of the virus in flies in epidemic areas, Maxcy and Howe are quoted as saying that the disease would not "attack children preponderantly, as is the case were it transmitted primarily by the fly or any other insect." This statement overlooks the fact that adults may not acquire certain insect borne diseases because they are immune. For instance, the part which flies play in the spread of some of the common types of bacillary dysentery is such as to allow us to use this disease as a homely example. The differential prevalence and severity of bacillary dysentery in infants as opposed to adults is familiar from one end of the world to the other.

And also there is the editorial statement that "present knowledge points to contact infection as the most important means of spreading infantile paralysis." For a disease in which the means of spread are unknown, this seems like a broad generalization. That contact infection (not as droplet infection but in the sense of direct contact with an infectious individual) may play a part in the spread of this disease few can deny, but that it is the most important means of spreading the disease is news. Perhaps new facts have been discovered, but without them contact infection seems too simple an explanation to fit the many obscurities which today cloud the epidemiologic picture of this disease. Contact infection has never satisfactorily explained the sharp summer incidence of poliomyelitis in certain temperate climates, such as the northern part of the United States, and Canada.

JOHN R. PAUL, M.D.

EXCRETION OF URINE WHILE TAKING SULFONAMIDES IN THE TROPICS

To the Editor:—In the article by Hageman, Harford, Sobin and Ahrens (THE JOURNAL, Oct. 9, 1943, p. 325) mention is made of "armed forces stationed in warm climates, where it is exceedingly difficult to maintain a satisfactory urinary output." In several instances in the literature I have noted casual mention of the obstacle of maintaining an ample excretion of urine in the tropics. This was not my experience during a study of sulfonamide toxicity at an evacuation hospital located in the tropics of the Southwest Pacific. Soldiers were able to maintain an adequate output with only a moderate amount of urging.

In 50 men receiving a routine sulfadiazine regimen an accurate intake and output was kept. The average output was 1,700 cc. and the average intake 2,500 cc. over the twenty-four hour period; 4,000 cc. intake was rarely reached; 1,000 cc. was considered the minimal safe output, and on only two occasions was it necessary to resort to infusions to raise the output; each time the intake had been low because of nausea and vomiting.

The majority of cases were dirty battle wounds. Sulfadiazine orally, 6 Gm. per day, and sulfanilamide topically were used exclusively. Alkalis were not used. The average duration in this series in which a patient had an intake-output record was seven days, the minimal five days and the maximal twenty-one days. Almost 200 blood sulfadiazine levels were determined and ranged from 5 to 15 mg. per hundred cubic centimeters, not one being below 5 mg.

Exact climatologic data were not released, but the temperature was oppressively warm and the humidity excessive to the point that the slightest exertion caused profuse perspiration. These observations on fluid balance seemed so paradoxical that we were led to hypothesize an obscure mechanism by which this satisfactory balance was obtained so effortlessly. Extension of the investigation and formation of other conclusions were barred by a transfer.

JAMES H. FERGUSON, Captain, M. C., A. U. S.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

BOARDS OF MEDICAL EXAMINERS BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL, Feb. 19, p. 528.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: *Part I-II.* Various centers, May 1-3. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY: *Oral.* *Part II.* Chicago, June 12-16. Final date for filing application is March 12. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Written.* Various large cities, May 8. *Oral.* Chicago, June 9-10. Final date for filing application is April 1. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF INTERNAL MEDICINE: *Oral.* Chicago, March 30-31. Final date for filing application is March 20. *Written.* Various centers Oct. 16. Candidates in military service may take examination at their place of duty. Final date for filing application is August 15. Asst. Sec., Dr. W. A. Werrell, 1301 University Ave., Madison, Wis.

AMERICAN BOARD OF OBSTETRICS & GYNECOLOGY: *Oral.* *Part II.* Pittsburgh, June 7-13. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF OPHTHALMOLOGY: Chicago, Oct. 5-7. Sec., Dr. S. Judd Beach, P. O. Box 1940, Portland, Me.

AMERICAN BOARD OF OTOLARYNGOLOGY: *Oral.* New York City, June 1-4. Sec., Dr. Dean M. Lierle, University Hospitals, Iowa City, Ia.

AMERICAN BOARD OF PEDIATRICS: *Oral.* New York, March 25-26, and San Francisco, May 6-7. Sec., Dr. C. A. Aldrich, 115½ First Ave. S.W., Rochester, Minn.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: *Written.* Various centers, March 31. *Oral.* Philadelphia, May 12-13. Final date for filing application is Feb. 29. Sec., Dr. Walter Freeman, 1028 Connecticut Ave. N.W., Washington, D. C.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Compensation of Physicians: Right of Physician Selected by Injured Employee to Recover from Employee Fees in Excess of Maximum Set Out in Workmen's Compensation Act.—In the course of his employment as a fire chief, Johnson was injured in a collision. His family physician immediately attempted to render treatment but, diagnosing the injury as a skull fracture, called in Dr. Werden, a specialist in brain surgery. The patient was unconscious when the brain surgeon arrived and did not regain consciousness for some weeks thereafter. Dr. Werden advised an immediate operation, and with the consent of Johnson's wife and the help of the family physician it was performed without delay. Thereafter Dr. Werden cared for the patient and a good recovery resulted. According to Dr. Werden, when he first saw Johnson he was informed by the family physician that the case was not a workmen's compensation case, and Mrs. Johnson asked him to care for Johnson "as a private case" and she and her husband would see that he was paid accordingly. Some weeks after the accident, after Johnson was so far recovered as to discuss the case and after it appeared that the injuries were to be compensable under the workmen's compensation act, it was agreed between the surgeon and Johnson that a fee of approximately one thousand dollars would be reasonable and Johnson agreed to pay any difference between this sum and the amount that would be allowed for medical fees under the compensation act. Subsequently the California industrial accident commission allowed an aggregate fee of \$481.48. The physician then assigned his claim against Johnson to the Credit Bureau of San Diego, which instituted an action against Mr. and Mrs. Johnson Jan. 8, 1943, seeking to recover \$568.52, the balance of the \$1,000 fee agreed on plus \$50 claimed by Dr. Werden for attendance as an expert witness in a suit brought by Johnson against the operator of the motor vehicle that collided with him. On Jan. 11, 1943 Johnson sent the physician \$200 and on the trial of the suit for fees this payment was taken into account in the judgment in the plaintiff's favor that resulted. Johnson and his wife then appealed to the appellate department, superior court, San Diego County, Calif.

Johnson and his wife contended that the claim of the plaintiff, pursuant to the contract between Dr. Werden and them, is against public policy and void, in that the workmen's compensation act of California and the constitutional amendment supporting it afford a complete and exclusive manner and procedure for adjusting all controversies as between an injured employee and his attending physician. There can be no doubt, answered the court, that as between an injured employee and his employer or insurance carrier the theory of Johnson and his wife is sound. As was said in *Nelson v. Associated Indemnity Corporation*, 19 Cal. App. (2d) 564, 66 P. (2d) 184:

It is well settled that the Workmen's Compensation Act provides substantially that, where the specified conditions exist, the right to recover compensation in a proceeding before the Industrial Accident Commission shall be, as against the employer, the exclusive remedy of the employee.

In the event, however, that a claim is presented by a physician for treatment rendered or prescribed for an injured employee and it appears that the physician was employed independently of procedure by the industrial accident commission, the problem becomes far more complicated. The right to make lawful contracts is a right enjoyed by all citizens under the protection of the fourteenth amendment of the constitution of the United States. In this case it is apparent that Dr. Werden having been called in by the attending physician, with the knowledge and approval of the wife of the injured employee, was by implication, if not indeed by express terms, proceeding under contract with Johnson and his wife. Can it be said that the workmen's compensation act and the provisions of the state constitution authorizing the statute were intended to abrogate the constitutional right of the parties so to contract? In approaching the problem we cannot assume that the legislature either wilfully or ignorantly intended to violate the organic

law of the United States. If two theories may reasonably proceed from the wording of the act, one in harmony with the organic law as expressed in the federal constitution and the other in conflict therewith, we must assume that the legislature intended the theory in harmony rather than the one in conflict. After Johnson's partial recovery and when he was in a mental condition to contract, he agreed with Dr. Werden that the schedule of fees provided by the industrial accident fund was inadequate to compensate him for the services rendered and that his fee should be approximately \$1,000. It is immaterial that this contract was entered into after the operation was performed rather than before. If, prior to the treatment, the patient was mentally able to contract, the contract would have been bilateral. After the services were rendered the contract was unilateral. In either event the consideration was sufficient and the agreement binding. We cannot say it is contrary to public policy, but, on the contrary, it is in harmony with the constitutional rights of the parties to enter into a lawful contract. We do not regard the circumstance that Dr. Werden in fact got part of his compensation from the insurance carrier as changing the situation.

Johnson and his wife next contended that the facts of the case do not warrant a liability on the part of Mrs. Johnson. The California Civil Code, section 171, provides, said the court, that the separate property of the wife is liable for the payment of debts contracted by the husband or wife for the necessities of life furnished to them or either of them while they are living together. That the services rendered by Dr. Werden were necessities of life cannot be disputed. The saving of the life of Johnson was as vital to his wife as to himself. As was said in *Evans v. Noonan*, 20 Cal. App. 288, 128 P. 794, in considering what constituted necessities of life:

In the present case, however, there is nothing which requires us to go further than to say that, under our law, it most certainly at the least means the common necessities of life, or such things as are proper and requisite for the sustenance of man. With equal certainty these include, besides food, clothing and shelter, such medical attentions in cases of illness as are absolutely requisite to relieve physical suffering and pain and to overcome or conquer disease, if by such attentions it can be done.

In order to subject the wife to the liability created by the Civil Code, continued the court, it is necessary to join her as a party defendant with her husband.

Johnson and his wife next challenged the propriety of the action of the trial court in including an item of \$50 in the judgment, which item is alleged to be due to Dr. Werden as a witness fee during the trial of the case in which he was called as a witness by Johnson, as noted. There was no evidence in the record as to an agreement between the Johnsons and Dr. Werden as to what his fee for serving as a witness should be, and in the absence of an express agreement the court held that the witness fees provided by statute were applicable. The California statute apparently provided a witness fee in civil cases of two dollars a day and mileage actually traveled, one way only, of 10 cents a mile. Under the circumstances the court thought it proper to reduce the charge to the statutory fee of two dollars plus mileage, which the court assumed was one mile.

Accordingly the judgment in favor of the plaintiff was reduced by \$47.90.—*Credit Bureau of San Diego, Inc. v. Johnson, et ux*, 142 P. (2d) 963 (Calif., 1943).

Society Proceedings

COMING MEETINGS

Alabama, Medical Association of the State of, Montgomery, April 18-20. Dr. D. L. Cannon, 519 Dexter Avenue, Montgomery, Secretary.
Arizona State Medical Association, Phoenix, April 14-15. Dr. Frank J. Milloy, 112 N. Central Ave., Phoenix, Secretary.
Arkansas Medical Society, Little Rock, April 17-18. Dr. W. R. Brooksher, 602 Garrison Avenue, Fort Smith, Secretary.
Florida Medical Association, St. Petersburg, April 13-14. Dr. Shaler Richardson, 111 West Adams St., Jacksonville, Secretary.
Iowa State Medical Society, Des Moines, April 21-22. Dr. Robert L. Parker, 3510 Sixth Avenue, Des Moines, Secretary.
Minnesota State Medical Association, Rochester, April 13-15. Dr. B. B. Souster, 493 Lowry Medical Arts Bldg., St. Paul, Secretary.
New Orleans Postgraduate Medical Assembly, New Orleans, March 6-9. Dr. Joseph S. D'Antonio, 1430 Tulane Ave., New Orleans 13, Secretary.
Northern Tri-State Medical Association, Toledo, Ohio, April 11. Dr. Oscar P. Klotz, 127 W. Hardin St., Findlay, Ohio, Secretary.
Tennessee State Medical Association, Nashville, April 11-13. Dr. H. H. Shoulders, 706 Church St., Nashville, Secretary.
Tri-State Medical Association of the Carolinas and Virginia, Charlotte, N. C., Feb. 28-29. Dr. James M. Northington, 804 Professional Bldg., Charlotte, N. C., Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1934 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Medical Sciences, Philadelphia 206:701-832 (Dec.) 1943

- Gradenigo Syndrome Complicated by Pneumococcal Meningitis: Recovery After Intensive Treatment with Penicillin and Sulfadiazine. L. F. Barker.—p. 701.
- Fever Curve of Therapeutic Fads. O. H. Perry Pepper.—p. 703.
- Detrimental Effect of Frequent Transfusions in Treatment of Patient with Hemophilia. F. L. Munro and H. W. Jones.—p. 710.
- *Treatment of Agranulocytosis with Sulfadiazine. N. Nixon, J. F. Eckert and K. H. Holmes.—p. 713.
- Acute Traumatic Heart Disease: Case of Myocardial Contusion with Recovery. R. V. Lee, N. T. Usher and G. H. Houck.—p. 722.
- Intravascular Parathyroid Grafts. M. R. Reid and J. Ransohoff.—p. 731.
- *Carcinoma of Duodenum. J. W. Howard.—p. 735.
- Prevention of Renal Precipitation of Sulfadiazine in Dogs. O. J. Jensen.—p. 746.
- *Clinical and Epidemiologic Features of an Outbreak of Primary Atypical Pneumonia of Unknown Etiology Among Hospital and Medical School Personnel. L. E. Young, M. Storey and A. J. Redmond.—p. 756.

Treatment of Agranulocytosis with Sulfadiazine.—Nixon and his collaborators report 3 instances of severe agranulocytosis developing in the course of sulfadiazine treatment. The complication occurred in the course of scarlet fever in 1 patient and of primary atypical virus pneumonia in 2. Each patient had received moderate doses of sulfadiazine for two or more weeks prior to the onset of bone marrow depression. Transfusion, pentose nucleotides and liver extract in 1 case were without beneficial effect. The drug treatment was resumed on the assumption that the streptococcus toxin might be the etiologic agent of agranulocytosis. The development of agranulocytosis during the pneumonic infections contradicted the assumption that the hemolytic streptococcus had been responsible in the first case. Sulfadiazine and convalescent serum were used in the other 2 cases. Although the infectious processes may have played a part, sulfadiazine probably was the primary factor in causing the agranulocytosis. Subsequent administration of large amounts of the drug seemed responsible for the ultimate recoveries. Agranulocytosis due to sulfadiazine administration during acute infections may be successfully treated by continued administration of the same drug. Spontaneous regeneration of polymorphonuclear leukocytes by the depressed bone marrow can occur during administration of large amounts of sulfadiazine even though this drug was responsible initially for the depression. Sulfadiazine appears to be effective in controlling sepsis, which usually accompanies agranulocytosis.

Carcinoma of Duodenum.—Howard reports 3 cases of primary duodenal carcinoma, 1 of which was associated with erosion of the superior mesenteric artery. There were recorded 55 carcinomas of the duodenum among 117,433 necropsies, an incidence of 0.047 per cent. In a group of 10,340 cases of carcinoma of the intestine the incidence of carcinoma of the small intestine amounted to 1.47 per cent. Of 163 cases of carcinoma of the small intestine the duodenum was involved in 37 per cent, the jejunum in 35 per cent and the ileum in 28 per cent, indicating, contrary to frequently quoted opinion, that the duodenum and the jejunum are more likely to undergo carcinomatous changes than the ileum. Carcinomas of the duodenum are generally conceded not to arise from preexisting ulcers and are seldom associated with polyposis. These tumors more commonly occur in a stenosing form and less frequently assume a polypoid structure. They metastasize late and usually then involve only adjacent tissues. Carcinoma of the duodenum occurs approximately three times more often in males than in

females. The complaints are chiefly referable to the stomach, although they are often mistaken for chronic cholecystitis, peptic ulcer or primary anemia. Vague epigastric distress with occasional attacks of pain, anorexia, weakness and loss of weight are usually present. Nausea and vomiting may occur, associated with recurrent attacks of intestinal obstruction. Anemia frequently will be the only presenting symptoms. Occult blood in the stools is a rather consistent finding. Roentgenograms are of increasing aid. The average duration has been from six to fourteen months. Unless diagnosed and treated early, the mortality is extremely high.

Outbreak of Primary Atypical Pneumonia.—An epidemic of primary atypical pneumonia broke out abruptly in the student body and staff of the University of Rochester School of Medicine and Dentistry and the Strong Memorial Hospital. Young and his associates report the clinical findings in 40 cases from the institutional personnel who were hospitalized with definite roentgenographic evidence of pneumonia between Aug. 1 and Sept. 30, 1942 and the results of epidemiologic studies of a slightly larger group of patients and of 1,587 contacts. All except 3 of the patients were between 19 and 30 years of age. The relative homogeneity of this group of patients and the circumscribed nature of the outbreak make it apparent that a single etiologic agent was responsible for virtually all the cases. Primary atypical pneumonia is difficult to diagnose on clinical and epidemiologic grounds, and therefore a "missed case" may be of great importance in its spread. Infection usually produces a characteristic clinical picture, but this can easily be confused with a number of other diseases. A positive diagnosis is established only when x-ray examination of the chest reveals typical findings, bacteriologic studies are negative and the subsequent course of the illness is consistent. Under ordinary conditions of exposure, primary atypical pneumonia is not highly communicable. If subclinical cases or healthy carriers occur they are probably of minor importance in transmission. Treatment is symptomatic only. Sulfonamide therapy is ineffective against the primary (probably virus) infection, but because of diagnostic difficulties its temporary use in full doses is obligatory for seriously ill patients until bacterial pneumonia, sepsis and other infections responding to chemotherapy can be excluded. The use of sulfonamide therapy later in the disease depends on the nature of complications. Transfusions of whole blood or plasma from convalescent donors appear to have no specific effect.

American Journal of Psychiatry, New York

100:301-442 (Nov.) 1943. Partial Index

- Psychoses Occurring in Soldiers During the Training Period. Margaret Hirschman and Zuleika Yarrell.—p. 301.
- Review of Cases of Veterans of World War II Discharged with Neuropsychiatric Diagnoses. C. B. Huber.—p. 306.
- Ratio of Voluntary Enlistment to Induction in Various Types of Neuropsychiatric Disorders. F. Lemere and E. D. Greenwood.—p. 312.
- Psychiatric Casualties Among Defense Workers. M. Rosenbaum and J. Romano.—p. 314.
- Enuresis in the Navy. A. Levine.—p. 320.
- Tattooing Among Selectees. J. Lander and H. M. Kohn.—p. 326.
- Psychiatric Approach in Problems of Community Management (From a Study of a Japanese Relocation Center). A. H. Leighton and others.—p. 328.
- Myokinetic Psychodiagnosis of Dr. Emilio Mira. J. L. Simon.—p. 334.
- Study of Forty Male Psychopathic Personalities Before, During and After Hospitalization. W. L. Heaver.—p. 342.
- Law Enforcement Aspects of Delinquency Problem. E. P. Coffey.—p. 347.
- *Immediate and Follow-Up Results of Electroshock Therapy. L. H. Smith, D. W. Hastings and J. Hughes.—p. 351.
- Borderline Cases Treated by Electric Shock. A. Myerson.—p. 355.
- Electroencephalograms in Post-Traumatic Epilepsy: Preoperative and Postoperative Studies. H. Jasper and W. Penfield.—p. 365.
- Electroencephalogram in Late Post-Traumatic Cases. M. Greenblatt, with technical assistance of Marie M. Healey and Gertrude A. Jones.—p. 378.
- Emotional Disturbances Following Upper Respiratory Infection in Children. Helen G. Richter.—p. 387.
- Psychoses in Patients with Edema. N. Roth.—p. 397.
- Incidence of Mental Disease in State of New York. C. Tietze.—p. 402.

Electroshock Therapy.—According to Smith and his associates electroshock therapy was practiced for over two years at the Pennsylvania Hospital. During this time 279 patients have received treatment. Electroshock treatment is effective in the

treatment of involutional melancholia and manic-depressive psychosis. Manic patients do not hold their recovery as well as those who have an agitated depression. There is no evidence that electroshock treatments may prevent future psychotic attacks or that it might interfere with spontaneous clinical recovery. Electroshock therapy is not effective in schizophrenia. It is of doubtful value in psychoneuroses. Traumatic skeletal injuries may be decreased by the use of "Inta Costrin." Cardiac and pulmonary complications, vasomotor collapse, spasticity and subconjunctival hemorrhages may develop. Memory changes always occur during treatment but do not seem to be permanent.

American Journal of Public Health, New York

33:1387-1508 (Dec.) 1943

- Penicillin Treatment of Early Syphilis: Preliminary Report. J. F. Mahoney, R. C. Arnold and A. Harris.—p. 1387.
Penicillin Therapy in Sulfonamide Resistant Gonorrhea in Men. C. J. Van Slyke, R. C. Arnold and M. Buchholtz.—p. 1392.
Planning Today for Public Health Administration Tomorrow. F. J. Underwood.—p. 1395.
Evolving Pattern of Tomorrow's Health: I. Prerequisites to Improved Public Health. J. W. Mountin.—p. 1401.
Id.: II. Postwar City. C. E. A. Winslow.—p. 1408.
Id.: III. Health Department of the Future. H. F. Vaughan.—p. 1414.
Id.: IV. The Health Worker of the Future. R. M. Atwater.—p. 1419.
Function of Health Officer in Control of Tuberculosis Among Veterans. L. I. Dublin.—p. 1425.
Public Health Degrees and Certificates Granted in the United States and Canada During Academic Year 1942-1943.—p. 1430.
*Air Disinfection in Day Schools. W. F. Wells.—p. 1436.
Some Medical Aspects of Protein Foods. F. J. Stare and G. W. Thorn.—p. 1444.
Studies on Epidemic Diarrhea of Newborn: Isolation of a Filtrable Agent Causing Diarrhea in Calves. J. S. Light and H. L. Hodes.—p. 1451.
Streptococcal Infections in Naval Training Station. F. F. Schwentker, H. L. Hodes, L. C. Kingsland Jr., B. M. Chenoweth Jr. and J. L. Peck.—p. 1455.
Laboratory Methods Used in Determining Value of Sulfadiazine as a Mass Prophylactic Against Meningococcal Infections. D. M. Kuhns and H. A. Feldman.—p. 1461.

Air Disinfection in Day Schools.—Wells states that epidemic spread of contagion in irradiated classrooms during winter months appears to have been checked for six years at the Germantown Friends School and for three years in two primary schools at Swarthmore. Measles, mumps and chicken-pox prevailed during the same period in unirradiated classrooms in these schools and in nearby primary schools. Epidemic spread of mumps in irradiated classrooms (of one of these schools) exposed during the fall was checked with the onset of cold weather. Failure of the lights to control the epidemic spread of mumps during the moist mild autumn weather suggests that the viricidal activity of ultraviolet light decreases with humidity. When respiratory infection is normally most prevalent during cold weather and indoor air is driest, irradiation was efficient. The importance of the classroom in the epidemic spread of childhood contagion through the community of Swarthmore was revealed by radiant disinfection of the air of the primary schools. The design which yields the highest average intensity per unit of ultraviolet light radiated into a room will generally accomplish the most disinfection per unit of intensity and prove hygienically more effective per unit of disinfection. An installation with several times the radiation per cubic foot performed less consistently, according to epidemiologic indexes, than one with higher efficiencies of irradiation and disinfection. It may seem contradictory that rooms with double the disinfection, five times the irradiation and ten times the radiation should prove to be hygienically less efficient, though this is consistent with the lower sanitary indexes of disinfection and irradiation efficiencies. It indicates that respiratory organisms travel less frequently from person to person through lethal zones. Bacteriologic tests showed that rotation of the reflectors to throw a horizontal beam across the room increased irradiation more than threefold and disinfection more than tenfold. That an even greater hygienic efficiency can be expected has been indicated by the superior epidemiologic indexes within rooms with one-half the disinfection and one-fifth the irradiation but with higher disinfection and irradiation efficiencies.

Archives of Ophthalmology, Chicago

30:707-840 (Dec.) 1943

- Visual Functions in Strophosymbolia. S. T. Orton.—p. 707.
*Traumatic Enophthalmos. R. L. Pfeiffer.—p. 718.
Recurring Attacks of Concomitant Exotropia, Each Followed by Transient Esotropia: Migraine the Probable Cause. F. H. Verhoeff.—p. 727.
Keratoconus Posticus Circumscriptus. I. H. Leopold.—p. 732.
Classification of Experimental Cataracts in Rat: Recent Observations on Cataract Associated with Tryptophan Deficiency and with Other Experimental Conditions. W. Buschke.—p. 735.
Dystrophic Cataracts and Their Relation to Other "Metabolic" Cataracts. W. Buschke.—p. 751.
Fitting of Contact Lenses. P. L. Salvatori and A. Oriani.—p. 763.
Neurodermatitis with Cataract: Report of 2 Cases. C. E. McDannald.—p. 767.
Retinal Detachment and Trauma. A. Knapp.—p. 770.
Plastic Shell for Use in Simple Evisceration of Globe. S. R. Gifford.—p. 775.
Local Anesthesia in Ophthalmology. W. S. Atkinson.—p. 777.

Traumatic Enophthalmos.—Pfeiffer states that enophthalmos developed subsequent to the injury in 53 of 120 cases of fracture of the bones of the face in which the orbit was involved. Fracture of the orbit was noted in every case of traumatic enophthalmos. In 29 cases external deformity occurred. In these cases fracture was obvious. In 24 cases fracture was internal or deep in the orbit, unassociated with solution of continuity or deformity of the margin of the orbit or of the surface structures. In all these 24 cases there was displacement of the eye of 1 to 9 mm. as measured by the Hertle exophthalmometer. In most of the cases the eye was displaced posteriorly 2, 3 or 4 mm. In the cases of more severe injury the eye was displaced posteriorly and slightly nasally. The displacement of the eye would have been overlooked clinically in a number of cases if the exophthalmometer had not been used on the suggestion of the roentgenographic report after the signs of recent trauma had subsided. Patients exhibiting signs of recent injury, such as ecchymosis and edema of a "black eye," should have an x-ray examination for possible internal fracture of the orbit. The development of enophthalmos after trauma is always an indication of fracture, usually of the floor and/or the nasal wall, frequently without solution of continuity of other parts of the orbit. The posterior displacement of the eye is due to the increase in the capacity of the orbit, which results from the fragmentation of the floor with prolapse of orbital content in some degree into the antrum and to fracture of the lamina papyracea with compression of the ethmoid cells. Treatment may not be needed if the enophthalmos is not severe. If diplopia is present in cases of less serious displacement the simpler means of relief may be operation on the extraocular muscles. In severe enophthalmos operation to raise the orbital structures from the antrum may be gratifying to the patient.

Bulletin of Los Angeles Neurological Society

8:97-154 (Dec.) 1943

- Traumatic Intracranial Aneurysm: Some Comments on Its Pathology, Based on Review of Literature and Study of Three Autopsied Cases. C. B. Courville.—p. 97.
Gross Calcareous Deposits in Corpora Striata and Dentate Nuclei: Report of 2 Cases, with Comments on Certain Etiologic Factors. C. W. Rand, O. W. Olsen and C. B. Courville.—p. 118.
Nuclear Changes in the Anterior Horn Cells Following Local Injury to the Spinal Cord. F. W. Bailey.—p. 129.

Bull. of the U. S. Army Med. Dept., Washington, D. C.

71:1-90 (Dec.) 1943

- Psychiatric Problems in Army Hospitals. W. C. Menninger.—p. 31.
Portable Surgical Hospital at Buna. G. A. Marks.—p. 43.
Acute Enteritis in North Africa. G. H. Gowen.—p. 55.
*Inspection of Oysters. A. H. Bryan.—p. 59.
Dentigerous Cyst: Case Report. N. V. Clemente.—p. 63.
Copper Sulfate Method for Measuring Specific Gravities of Whole Blood and Plasma. R. A. Phillips, D. D. Van Slyke, V. P. Dole, K. Emerson Jr., P. B. Hamilton and R. M. Archibald.—p. 66.
Unusual Type of Anthrax in Horses and Mules. R. McNellis.—p. 84.
Simplified Full Impression Technic. A. W. Suhr and V. I. Tillar.—p. 87.

Inspection of Oysters.—According to Bryan, oysters contain 6 per cent of protein, 6 per cent of glycogen, 1.9 per cent of fat, vitamins A, B, C, D and G and the minerals calcium, iron, copper, phosphorus, sulfur and iodine. Oysters provide amino acids, arginine, histidine, lysine and tryptophan neces-

sary in the metabolism of the protein molecule. Unwashed oysters are shucked and put into tanks, where air is forced through the water, so that sand and shell fragments are washed out and skimmed. Plant sanitation is similar to that of dairies. Shuckers and canners should be subject to periodic medical examinations with close check on intestinal and respiratory infections of all plant workers. Open oysters will keep three weeks at a temperature of 32 F. and for ten days at 40 F. Fresh oysters up to 7 days old show a pH of 6.0 or above, but as the oyster gets older, stale or sour the pH decreases directly proportional to the acidity. Stale oysters have a pH range from 5.6 to 6.0, and sour oysters have pH 5.6 or below. The hydrogen potential or pH range can be determined by a test, which is briefly described.

Canadian Journal of Public Health, Toronto

34:481-528 (Nov.) 1943

Public Health and Social Security. A. Groulx.—p. 481.

Social Aspects of Syphilis Problem. G. Fleming.—p. 487.

Venereal Disease Education in Industry. H. C. Rhodes and D. E. H. Cleveland.—p. 494.

Preparation and Preservation of Typhoid Suspensions for V Agglutination Test. J.-M. Desranleau.—p. 502.

Intradermal Immunization with Diphtheria Toxoid. F. O. Wishart.—p. 509.

34:529-582 (Dec.) 1943

State of Health of People of Canada in 1942. J. J. Heagerty and J. T. Marshall.—p. 529.

*Cheese Borne Epidemic of Typhoid Fever. J. Gauthier and A. R. Foley.—p. 543.

Preparation and Standardization of Johnin Purified Protein Derivative. C. W. McIntosh and H. Konst.—p. 557.

Antitoxin Response to Diphtheria Toxoid of Low Alum Content. C. M. Horner, F. O. Wishart and G. G. Waters.—p. 564.

Contribution of Association's Vital Statistics Section to National Vital Statistics. A. H. Sellers.—p. 568.

Use of Volunteers in Public Health Nursing. Report of Subcommittee of Study Committee, Public Health Nursing Section, Canadian Public Health Association.—p. 571.

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Delaware State Medical Journal, Wilmington

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Journal of Clin. Endocrinology, Springfield, Ill.

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Journal of Pediatrics, St. Louis

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Relation Between Chemical Structure and Physiologic Disposition of Series of Substances Allied to Sulfanilamide. S. H. Fisher, L. Troast, Alice Waterhouse and J. A. Shannon.—p. 373.

Journal of Thoracic Surgery, St. Louis

12:607-696 (Oct.) 1943

- *Pulmonary and Blood Gas Studies in Experimental Asphyxia and Asphyxial (Anoxic) Resuscitation: Comparison of Methods of Resuscitation. G. L. Birnbaum and S. A. Thompson, with the technical collaboration of E. Ostrow.—p. 607.
- *Asphyxial Resuscitation: Phenomenon and Its Mechanism. S. A. Thompson and G. L. Birnbaum.—p. 624.
- Diverticulum of Right Primary Bronchus. J. Arce.—p. 638.
- Coronary Ligation in Wounds of Heart: Report of Case in Which Ligation of Anterior Descending Branch of Left Coronary Artery Was Followed by Complete Recovery. E. de Jesus Zerbini.—p. 642.
- Problem of Wound Infection in Thoracoplasty. Y. K. Wu, M. B. Pianetto.—p. 648.
- Wound Healing After Thoracoplasty in Tropical Hospital. R. A. S. Cory.—p. 653.
- Transpleural, Intrathoracic Ligation of the Left Common Carotid Artery: First Case Report. F. P. Coleman.—p. 659.
- Bronchoscopy in Pulmonary Tuberculosis. M. S. Lloyd and J. A. Budetti.—p. 668.
- Massive Conglomerate Lesions of Silicosis Differentiated from Pulmonary Neoplasm. R. A. Rendich and M. R. Camiel.—p. 686.

Pulmonary and Blood Gas Studies in Experimental Asphyxia.—Birnbaum and his collaborators report experiments on methods of resuscitation. This communication deals with (a) obstructive asphyxia and inhalation asphyxia with nitrogen and (b) pulmonary and blood gas studies at various stages of asphyxia. The studies were made on dogs. The authors conclude that: 1. Experimental evidence indicates that rhythmic inflation and suction of the lungs in advanced asphyxia, using safe pressures, is superior to manual artificial respiration, rhythmic inflation alone or rhythmic suction alone. 2. Rhythmic inflation and suction of the lungs has definite resuscitative power even when an inert (asphyxiating) gas is used. 3. Rhythmic inflation and suction is a more rapid and more effective stimulator of the circulation and respiration than the other methods tested. 4. Preliminary experimental evidence supports the hypothesis of acidosis and shock in advanced asphyxia, with a relative acardia as an accompanying state. 5. The hypothesis is presented that in asphyxia the anaerobic conversion of glycogen to lactic acid may supply limited energy for the heart and brain. This, together with the reflex stimulation it affords, could explain the effectiveness of asphyxial (anoxic) resuscitation in advanced asphyxia.

Asphyxial Resuscitation.—Thompson and Birnbaum produced various stages of asphyxia in dogs by obstruction of the trachea or by inhalation of inert (asphyxiating) gases such as nitrogen or helium. If the asphyxiating procedure is not stopped within twenty to thirty seconds after the cessation of respiration spontaneous recovery does not occur. However, if within periods of forty-five seconds to two and one-half minutes after cessation of respiration, suck-and-blow resuscitation with inert (asphyxiating) gas is applied, resuscitation of the circulation and respiration can be accomplished in 85 per cent of instances. The addition of 10 per cent carbon dioxide to the inert gas inhibits resuscitation by depression of the medullary centers. Bilateral vagus section before asphyxia is started prevents resuscitation with inert gas. The carotid sinuses are also concerned in this phenomenon. Asphyxial resuscitation is primarily a reflex phenomenon which is initiated most efficiently by suck-and-blow resuscitation. It appears that the mechanical inflation and deflation of the lungs by means of a suck-and-blow resuscitator with an inert gas brings into play two powerful reflex stimulants to the cardiovascular and respiratory centers. Of these reflexes the one occurring on suction deflation of the lungs appears to be the more powerful. This reflex does not appear to be stimulated by passive expiration as obtained by inflation and release of the lungs. It does not appear to be stimulated by manual artificial respiration, but it is quite regularly stimulated by suction deflation of the lungs. Asphyxial resuscitation is not recommended for clinical application, since the use of oxygen gives far superior results. Clinically, in advanced asphyxia when the respiration has ceased, the authors recommend that advantage should be taken of the phenomenon by the administration of oxygen or oxygen-carbon dioxide by the suck-and-blow type of resuscitation within safe limits of pressure.

Medical Annals of District of Columbia, Washington

12:455-494 (Dec.) 1943

- Injuries of Urinary Tract. L. G. Lewis.—p. 455.
- Injuries of Bones and Joints. R. V. Funsten.—p. 458.
- Civilian Practice of Surgery Under War Conditions. H. B. Stone.—p. 463.
- Current Status of Blood Substitutes. J. B. Alsever.—p. 465.
- New Chemotherapeutic Agents in Treatment of Infectious Diseases—Sulfamerazine and Sulfamethazine. H. F. Dowling.—p. 468.

Military Surgeon, Washington, D. C.

93:443-492 (Dec.) 1943

- *Mass Treatment with Sulfadiazine—Its Effect During an Outbreak of Meningococcic Meningitis. W. B. Lewis, H. Bolker and D. Klein.—p. 443.
- Ten Factors in Closed Plaster Technic for Compound Fractures of Lower Extremities. E. T. Rumble and J. A. Millsbaugh.—p. 448.
- *Treatment of Sulfonamide Resistant Gonorrhea—Preliminary Report. E. C. Lowry and L. W. Hewit.—p. 449.
- Convalescent Care and Morale of Patients. H. M. Thomas Jr.—p. 453.
- Plilonid Sinus: Method of Closure by Musculofascial Flaps. L. Miscall and J. S. Holder.—p. 457.
- Incidence of Dental Caries Among Aviation Cadets. W. W. Senn.—p. 461.
- Fracture of Carpal Navicular. W. E. Allen Jr.—p. 464.
- Lymphogranuloma Venereum: Review of 26 Cases at a Station Hospital in India. H. S. Fein and F. Berchenko.—p. 468.
- Serum Reactions: Working Classification. J. A. Rudolph.—p. 473.
- Anuria Caused by Sulfadiazine Crystallization: Report of Case. S. A. Nagel Jr. and D. O. Weiner.—p. 478.
- Simplest Instrument for Removal of Foreign Bodies in Cornea. A. Appelbaum.—p. 479.
- Rapid Staining Technic for Malarial Parasites. A. H. Chernoff.—p. 480.

Mass Treatment with Sulfadiazine During Meningococcic Meningitis.—Lewis and his associates report an outbreak of meningococcic meningitis at a camp and administration of small doses of sulfadiazine to an entire cantonment as a measure of control. The total number of cases in the outbreak was 49. The first control measures taken were the isolation of organizations in which a case appeared and the culturing of the nasopharynxes of contacts. The carrier rate averaged 12.5 per cent, but in individual organizations the rate varied up to 42.3 per cent. The carriers were admitted to special wards. Each was given 2 Gm. of sulfadiazine daily for two days, then 1 Gm. daily for two days. Fluids were forced. Clinically, no ill effects were noted in 897 patients. Every carrier who showed a positive nasopharyngeal culture subsequent to treatment with sulfadiazine was given a course of sulfanilamide; this was necessary in 30 carriers. Every carrier but 1 became negative with either sulfadiazine or subsequent sulfanilamide. He was treated with sulfathiazole solution to the nasopharynx and showed negative cultures thereafter. Carriers were returned to duty after the second consecutive negative culture, done on the sixth day after onset of treatment. That cure of meningococcus carriers is possible with the sulfonamide drugs has been demonstrated previously. However, large doses were used, necessitating hospitalization. The risk of complications due to the drug increases as the dosage is raised. With the described low dosage, the procedure is applicable to large organizations while on duty. The necessity for extensive laboratory facilities is obviated. The immediate cessation of case appearance, with the exception of 1 in a control group, points to the administration of the drug as the determining factor. Administration of sulfadiazine to large groups of men for reduction of the meningococcus carrier rate is feasible.

Treatment of Sulfonamide Resistant Gonorrhea.—Fifty consecutive cases of sulfonamide resistant gonorrhea were treated by Lowry and Hewit with fever therapy at 105 F. for five hours, after administration of 7 Gm. of sulfathiazole during the eighteen hour period prior to treatment. Eighty-two per cent of the cases so treated were cured by the first treatment. Fever therapy in combination with sulfadiazine has proved satisfactory in a small series of cases. Any factor which produces urethral stasis and uncleanness contributed toward chronicity in these cases. Hence phimosis, the small meatus and urethral strictures were dealt with prior to the administration of fever therapy. General supportive measures such as a high caloric bland diet, forcing fluids to 4,000 cc. daily, hot sitz baths and absolute cleanliness of the genitalia are important factors in curing these cases. The period of hospitalization can be reduced by the use of fever therapy in combination with sulfathiazole in cases of sulfonamide resistant gonorrhea.

sary in the metabolism of the protein molecule. Unwashed oysters are shucked and put into tanks, where air is forced through the water, so that sand and shell fragments are washed out and skimmed. Plant sanitation is similar to that of dairies. Shuckers and canners should be subject to periodic medical examinations with close check on intestinal and respiratory infections of all plant workers. Open oysters will keep three weeks at a temperature of 32 F. and for ten days at 40 F. Fresh oysters up to 7 days old show a pH of 6.0 or above, but as the oyster gets older, stale or sour the pH decreases directly proportional to the acidity. Stale oysters have a pH range from 5.6 to 6.0, and sour oysters have pH 5.6 or below. The hydrogen potential or pH range can be determined by a test, which is briefly described.

Canadian Journal of Public Health, Toronto

34:481-528 (Nov.) 1943

- Public Health and Social Security. A. Groulx.—p. 481.
Social Aspects of Syphilis Problem. G. Fleming.—p. 487.
Venereal Disease Education in Industry. H. C. Rhodes and D. E. H. Cleveland.—p. 494.
Preparation and Preservation of Typhoid Suspensions for V Agglutination Test. J.-M. Desranleau.—p. 502.
Intradermal Immunization with Diphtheria Toxoid. F. O. Wishart.—p. 509.

34:529-582 (Dec.) 1943

- State of Health of People of Canada in 1942. J. J. Heagerty and J. T. Marshall.—p. 529.
*Cheese Borne Epidemic of Typhoid Fever. J. Gauthier and A. R. Foley.—p. 543.
Preparation and Standardization of Johnin Purified Protein Derivative. C. W. McIntosh and H. Konst.—p. 557.
Antitoxin Response to Diphtheria Toxoid of Low Alum Content. C. M. Horner, F. O. Wishart and G. G. Waters.—p. 564.
Contribution of Association's Vital Statistics Section to National Vital Statistics. A. H. Sellers.—p. 568.
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- Functional Prepuberal Castration in Males. C. G. Heller, W. O. Nelson and A. A. Roth.—p. 573.
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Relation Between Chemical Structure and Physiologic Disposition of Series of Substances Allied to Sulfanilamide. S. H. Fisher, L. Troast, Alice Waterhouse and J. A. Shannon.—p. 373.

their former levels in the great majority of these cases. After hemolysis the most important toxic reaction was allergic dermatitis, which occurred in 16 per cent of the patients. Two thirds of these have been desensitized; in only 3 per cent has the procedure proved entirely unsuccessful. Allergic rhinitis developed in 1 patient. Other untoward reactions, headaches and nausea, are generally mild and ephemeral. Nausea, which occurred in 35 per cent of cases, is transitory and can be prevented by injecting the drug more slowly. Of 22 patients who took the intravenous promin therapy for at least twelve months, 15 were improved, 6 were stationary and 1 was worse. Among an additional 46 patients who had taken intravenous promin therapy for shorter periods, 26 showed objective improvement, 17 were stationary and 3 were worse. There were 16 patients in whom treatment was discontinued. A control experiment was undertaken with a prominlike drug, Interval Antiseptic 307. This substance, which is sodium-4,4'-diaminodiphenylsulfone-2-acetylsulfonamide, is closely related chemically to promin and has a similar action in leprosy. It was chosen for oral administration instead of promin. Twenty patients were treated with this drug and 20 were given placebos. After eight months there was a difference in the two groups. While the course of the disease continued unabated in the control group, it was checked in a considerable percentage of the treated patients. Promin can be considered to have opened a new avenue in the chemotherapy of the mycobacterial diseases.

Radiology, Syracuse, N. Y.

41:527-636 (Dec.) 1943

- Symposium on Injuries of Head, Chest and Back: Head Injuries. H. E. Mock.—p. 527.
Some Considerations Concerning Roentgen Diagnosis of Skull Fractures. J. C. Kenning and I. D. Harris.—p. 532.
Management of Jaw Fractures. F. W. Merrifield.—p. 539.
Roentgenologic Diagnosis of Chest Injuries. J. P. Bennett.—p. 543.
Back Injuries: Introduction. H. E. Mock.—p. 551.
Anatomic and Physiologic Considerations Prerequisite to Diagnosis of Back Trauma. E. J. Carey.—p. 554.
Differential Diagnosis of Traumatic Lesions of Spine. S. A. Morton.—p. 560.
Pseudotumor of Bone in Hemophilia. A. P. Echternacht.—p. 565.
Diffuse Calcification of Placenta Demonstrable in Vivo. S. Thomas.—p. 573.
Pneumonic Densities Obscured by Cardiac Shadow. G. H. Stein.—p. 576.
*March Fracture of Tibia. G. R. Krause and J. R. Thompson Jr.—p. 580.
*March Fracture of Inferior Pubic Ramus. Report of 3 Cases. D. B. Jones.—p. 586.
Basilar Impression: Position of Normal Odontoid. W. M. Saunders.—p. 589.

March Fracture of the Tibia.—Krause and Thompson encountered 3 instances of march fracture of the tibia within two months, and the search of the files revealed a fourth case. Although stress fractures of the tibia are not as frequent as those of the metatarsals, they will probably be seen with increasing frequency in the armed forces. The fracture line is usually narrow and must be sought for carefully. Callus formation is seen early. The history is quite similar to that obtained in march fractures of the metatarsals, varying only in the site of pain.

March Fracture of the Inferior Pubic Ramus.—Jones presents clinical histories of 3 soldiers aged 34, 25 and 26 whose complaints were diagnosed as march or stress fracture of the inferior pubic ramus. There was no history of trauma. X-ray examination revealed rarefaction across the inferior ramus of the pubis with a zone of periosteal proliferation at the margins, the periosteal reaction being most prominent on the upper margin of the ramus. The only case previously discovered in a superficial survey of the literature is that of Wilhelm, in which the x-ray appearance was in all respects comparable to that in the cases reported here. This case appeared in the German literature and was discovered in a member of the German army. The author stated that these and all "march" or "insidious" fractures occurred in men of previous sedentary existence who were suddenly introduced into rigorous military training. The fractures occurred in trainees and not in the older conditioned soldiers. These criteria were present in the cases described in this report.

Review of Gastroenterology, New York

10:279-322 (Nov.-Dec.) 1943

- Case of Human Parasitosis Caused by Isospora Bigemina. J. Raifman.—p. 279.
Nutritional Problems in Cardiac Disorders. H. A. Monat.—p. 282.
Clinical Investigation of Aluminum-Phosphate Gel. R. Upham and N. W. Chaikin.—p. 287.
Anatomic Basis for Study of Splanchnoptosis: Paths of Ascent to Erect Position from Birth to Fourth Year of Life and Their Relation to Splanchnoptosis and Body Form and Body Cavities. Agnes C. Victor.—p. 298.
Treatment of Gallbladder Syndrome. B. M. Bernstein.—p. 311.

Rhode Island Medical Journal, Providence

26:275-322 (Dec.) 1943

- Rehabilitation Center. A. P. Aitken.—p. 286.
Medical and Surgical Treatment of Varicose Veins, Pulmonary Emboli, and Gastric and Duodenal Ulcer. A. V. Migliaccio, A. W. Allen and W. B. Breed.—p. 293.
Wartime Civilian Medical Care. E. S. Wing, C. J. Ashworth and A. L. Potter.—p. 294.
Women in Industry. C. L. Farrell, H. E. Harris, S. D. Davies, M. H. Sullivan and W. P. Buffum.—p. 303.

South Carolina Medical Assn. Journal, Florence

39:263-290 (Nov.) 1943

- Medical Statistics of South Carolina: III. Evolution of Distribution of State Physicians. A. M. Lassek.—p. 263.
Certain Related Factors to Be Considered in Use of Digitalis. J. T. Quattlebaum.—p. 267.
Military Medical Tour. J. W. White.—p. 281.

39:291-324 (Dec.) 1943

- Hepatorenal Syndrome. H. G. Smithy and D. L. Maguire Jr.—p. 291.
Pneumothorax in the Newborn. G. D. Johnson.—p. 299.

Southern Medical Journal, Birmingham, Ala.

36:781-840 (Dec.) 1943

- The Nation's Most Valuable Asset and Its Greatest Problem. H. F. Garrison.—p. 781.
Negro Demonstration Center for Maternal and Newborn Care in Alabama. T. M. Boulware, Elizabeth LaForge and R. C. Stewart.—p. 784.
Military Gastroenterology. J. W. Annis and F. G. Eldridge.—p. 791.
Uses of Quinine in Symptomatic Treatment of Acute Respiratory Infections. G. S. M. Cowan.—p. 798.
Ventricular Tachycardia as Therapeutic Problem in Coronary Thrombosis. R. L. McMillan.—p. 800.
Auricular Flutter. N. Bloom, R. Hoffman and Sara Hoover.—p. 804.
Hypertrophy and Dilatation of Right Side of Heart. M. C. Wheelock.—p. 806.
Acute Syphilitic Meningitis: Clinical Study of 15 Cases. J. E. Skogland.—p. 809.
Movable Kidney. J. U. Reaves.—p. 815.
*Trichomoniasis in Male: Seventh Venereal Disease? G. G. Allison.—p. 821.
Glioblastoma Multiforme of Brain and Spinal Leptomeninges: Report of Case. P. Marcusc.—p. 823.

Trichomoniasis in the Male.—Allison found that the motility of the trichomonads in the male urethra is quite frequently lost, so that examination of the hanging drop obtained from washing a tiny cotton swab in the urethral discharge suspended in isotonic solution of sodium chloride does not reveal the parasite. When the meatus is cleaned and fresh pus is expressed from the urethra and smeared thinly on a slide which is then stained with Sellers Negri stain, this parasite may be easily identified. Urethral itching and a milky, watery discharge from the male urethra should call for a careful search for this organism, particularly in the absence of gonococci and *Treponema pallidum*. The author found in his private practice an incidence of 15 per cent of trichomonads in the male. This group was composed entirely of white patients. The organism was found independent of gonococci as well as associated with them. In about 1 per cent of the males the trichomonads were found in the prostatic and seminal vesicular secretions. Several sterile patients were found infected with trichomonads. The author examined a large number of Negro draftees. Many of them presented a milky whitish urethral discharge smears of which showed a large number of epithelial cells, a moderate number of pus cells and a fair number of monocytes. Trichomonads were observed in a large number of these smears. In the treatment the urethra must be examined with a bougie. In the presence of a congenital stricture of the meatus a meatotomy must be done and the urethra dilated to a 30 F. caliber. This

New England Journal of Medicine, Boston**229:855-884 (Dec. 2) 1943**

- *Abnormal Nitrogen Metabolism in Patients with Thermal Burns. F. H. L. Taylor, S. M. Levenson, C. S. Davidson and Margaret A. Adams.—p. 855.
- Prevention of Vitamin Deficiencies in Wartime. F. R. Stenzel.—p. 859.
- Erythroblastosis Fetalis of the Icterus Gravis Type: Report of 2 Cases with Recovery. D. A. Nickerson and R. T. Moulton.—p. 863.
- Otogenous Infection Due to *Proteus* Bacillus: Report of Case. O. A. Lathrop.—p. 867.
- Treatment of Thermal Burns: II. Recent Developments. C. C. Lund.—p. 868.

Abnormal Nitrogen Metabolism in Burns.—Taylor and his co-workers present observations on disturbances of the nitrogen metabolism in severely burned patients admitted to the Boston City Hospital as the result of the Coconut Grove disaster. Azotemia was a common complication of severe burns and was usually of the reversible type. It occurred early and was relieved when the urine output became normal. An irreversible type of azotemia occurred in severely burned patients excreting an acid urine in whom hemoglobinemia and hemoglobinuria were present. In certain severely burned patients having coincidentally hemoglobinemia and hemoglobinuria there was an abnormality in the partition of both the blood and the urine nitrogen, associated with the presence of large amounts of residual or undetermined nitrogen. The percentage of total nitrogen of the urine present as urea was low. Hypoproteinemia was a common finding in the severely burned patients. A transitory hypoproteinemia was associated with plasma loss and could be restored by simple dietary means, but the more progressive type was probably due to the loss of large amounts of nitrogen into the urine owing to increased protein catabolism, in addition to large losses of nitrogenous material at the burned surface. Inversion of the albumin and globulin ratio frequently occurred. When it happened early it was probably associated with a preferential loss of albumin, which has a low molecular weight. The cause of its late occurrence in burned patients has not been determined. The serious problem of the maintenance of adequate nitrogen metabolism in severely burned patients may be met in part by forced alimentation.

New Orleans Medical and Surgical Journal**96:239-290 (Dec.) 1943**

- Normal Variations of T Wave Seen Among Soldiers. H. Dupuy.—p. 239.
- Important Considerations in Treatment of Toxic Gout. W. H. Cole.—p. 247.
- End Results in Surgical Treatment of Gastric Carcinoma. H. H. Morris Jr.—p. 254.
- Pathology of Arteriosclerosis. G. N. Irvine Jr. p. 262.
- Atypical Pneumonia Complicating Severe Varicella in an Adult. L. E. Rausch, T. J. Grable and J. H. Musser.—p. 271.

New York State Journal of Medicine, New York**43:2351-2460 (Dec. 15) 1943**

- Administrative Difficulties of City Department of Health in Wartime. E. L. Stebbins.—p. 2385.
- *Aseptic Necrosis and Bone Infarcts in Caisson and Noncaisson Workers. H. K. Taylor.—p. 2390.
- Use of Strained Meats as Protein Basis for Milk Substitutes in the Treatment of Milk Allergy. J. Glaser.—p. 2399.
- Tumors of Nose and Nasopharynx. A. A. Eggston.—p. 2403.
- Treatment of Gallbladder Disease. A. F. R. Andresen.—p. 2413.
- Intravenous Calcium Gluconate as Aid in Reduction of Posttransfusion Reactions. I. Sherman, B. B. Alperstein and B. K. Sherman.—p. 2419.

Aseptic Necrosis and Bone Infarcts in Caisson and Noncaisson Workers.—Taylor directs attention to the fact that bone infarcts and areas of aseptic necrosis have been found in workers who worked under increased atmospheric pressures. He describes the roentgenologic aspects of these lesions and discusses their probable relation to aeroembolism. Lesions of a similar type have been observed in persons who were not exposed to increased pressures. He studied 50 persons with bone infarcts and aseptic necrosis and found that 12 had a history of exposure to compressed air. The shaft and joint lesions do not develop immediately following decompression illness. Considerable time must elapse. The shaft lesions are usually asymptomatic and are discovered accidentally. The joint

lesions develop secondary arthritic changes and are similar to chronic hypertrophic osteoarthritis. Shaft lesions are found in some patients and joint lesions in others, and some present both types of lesions. The same lesions were observed in 38 persons who never worked under compressed air and were not subjected to sudden or violent changes in atmospheric pressure. The lesions in the two groups present similar x-ray appearances and cannot be differentiated one from the other. In the caisson worker the causative factor is the inert gas nitrogen in bubble formation, as an embolus, as pressure or both, interfering with the circulation to the part. In the noncaisson worker there is no apparent etiologic factor. The bone lesions may be single; usually they are multiple and often bilateral. Workers under compressed air presented extensive and multiple lesions more often than the others. In the noncaisson worker, when the lesion is single and not extensive, the reparative changes are usually greater. Deep sea divers and aviators may develop aeroembolism, but there are no recorded evidences of bone changes in either naval or air personnel who have had aeroembolism.

Oklahoma State Medical Assn. Jour., Oklahoma City**36:507-552 (Dec.) 1943**

- Treatment of Compound Fractures. M. A. Connell.—p. 507.
- Problems of Induction. M. L. Belot.—p. 511.
- Observations on the Negro Diabetic. P. B. Cameron.—p. 517.

Pennsylvania Medical Journal, Harrisburg**47:193-320 (Dec.) 1943**

- Infant Feeding in a Rationed Era. N. M. MacNeill.—p. 209.
- Diagnosis and Treatment of Sciatic Syndrome. S. N. Rowe.—p. 212.
- Gold Therapy in Arthritis. J. Lausbury.—p. 216.
- Intestinal Obstruction. M. Lick.—p. 221.
- Roentgen Ray Treatment of Acute Inflammatory Conditions. G. E. Pfahler.—p. 225.
- Plication of Internal Oblique Muscle in Repair of Direct and Recurrent Hernias. J. A. Soffel.—p. 229.

Public Health Reports, Washington, D. C.**58:1729-1760 (Nov. 26) 1943**

- *Promin Treatment of Leprosy. Progress Report. G. H. Faget, R. C. Pogge, F. A. Johansen, J. F. Dinan, B. M. Prejean and C. G. Eccles.—p. 1729.
- Experimental Transmission of Rickettsiae of Spotted Fevers of Brazil, Colombia and United States by Argasid Tick *Ornithodoros Nicollei*. G. E. Davis.—p. 1742.

58:1761-1792 (Dec. 3) 1943

- Detection and Analysis of Arsenic in Water Contaminated with Chemical Warfare Agents. C. C. Ruchhoft, O. R. Placak and S. Schott.—p. 1761.
- Smallpox in Relation to State Vaccination Laws and Regulations. B. C. Hampton.—p. 1771.

58:1793-1836 (Dec. 10) 1943

- Emergency Minimum Sanitation Standards. B. C. Hampton.—p. 1793.

Promin Treatment of Leprosy.—Promin, sodium salt of p,p'-diaminodiphenylsulfone-N,N'-di-(dextrose sulfonate), has been used in experimental tuberculosis in guinea pigs with remarkable success. Its experimental use in leprosy was commenced by Faget and his associates two years ago. Promin can be given orally or intravenously, but oral doses are tolerated for such short periods that this mode of medication was abandoned in favor of the intravenous injection. The majority of patients have received from 1 to 5 Gm. daily for six days a week. Most of the patients were given the 5 Gm. dose, and the course of treatment was continuous for months with only short intervals of rest of one to two weeks three times a year. The intravenous administration may cause a slow destruction of the erythrocytes. The authors do complete blood counts routinely every two weeks on every patient on promin treatment. Anemia occurred in 46 per cent of cases after six weeks of intravenous promin therapy. The longer the treatment, the greater the number of anemic patients. During the complete course of treatment the erythrocytes fell to 3.5 million or less in 71 per cent of cases and below 3 million in 9 per cent. Anti-anemic therapy, with or without cessation of promin, was successful in raising the red blood cells and hemoglobin to

should be carefully excised from the upper part of the epididymis. Complete excision is practically always possible and should be attempted, as incomplete excision leads to a recurrence. In cases in which the cyst is punctured and doubt exists as to whether complete excision has been performed the area of attachment to the epididymis should be cauterized with a diathermy point. Absolute hemostasis is essential to prevent a collection of blood in the scrotal integument.

British Journal of Urology, London

15:79-120 (Sept.) 1943

Radium Treatment for Carcinoma of Urinary Bladder: Report of 93 Cases Treated Over a Nine Year Period. A. Jacobs.—p. 79.

*Peyronie's Disease. A. J. D'Abreu.—p. 90.

Four Cases of Hypertension Which Benefited from Surgical Procedures. H. P. Winsbury-White.—p. 90.

Peyronie's Disease.—D'Abreu reports the treatment of a man aged 49 who had a lesion the width and hardness of a pencil and an inch in length in the mid-dorsal region of the penis. Radium needles were used superficially to treat the lesion on three consecutive nights. Examination at the end of three months showed that the lesion had completely disappeared. The author thinks that the disorder has nothing to do with the corpora cavernosa and that it is a contraction of the raphe between the two, something similar to what occurs in Dupuytren's contraction of the palmar fascia.

British Medical Journal, London

2:599-632 (Nov. 13) 1943

Comprehensive Attack on Pulmonary Tuberculosis. A. S. MacNalty.—p. 599.

Acceleration of Coordinated Muscular Effort by Nicotinamide: Preliminary Report to Medical Research Council. I. M. Frankau.—p. 601.

Anxiety States in Navy: Clinical Survey and Impression. G. V. Stephenson and K. Cameron.—p. 603.

Nitrous Oxide Anesthesia: Critical Evaluation. R. B. Gould.—p. 607.

March Fracture of Metatarsal Bones. H. H. Fouracre Barns.—p. 608.

Journal of Pathology and Bacteriology, Edinburgh

55:397-510 (Oct.) 1943

Cellular Changes in Lymph Nodes of Experimental Mice with Special Reference to Plasma Cell Development. L. Dorothy Parsons.—p. 397.

Growth of a Dibenzanthracene Produced Mouse Sarcoma in Chorio-allantoic Membrane of the Chick. F. Jacoby, S. McDonald and D. L. Woodhouse.—p. 409.

Preparation of Precipitating Serums for Identification of Animal Species. H. Proom.—p. 419.

Protective Properties of Alpha Antitoxin and Antihyaluronidase Occurring in Clostridium Welchii Type A Antiserum. D. G. Evans.—p. 427.

Clumping of Pathogenic Staphylococci in Plasma. F. M. Berger.—p. 435.

*Production of Penicillin. S. W. Challinor and J. MacNaughtan.—p. 441.

Complement Activity of Serum of Healthy Persons, Mothers and New-born Infants. B. Traub.—p. 447.

Extracts of Bacterium Shigae as Immunizing Agents in Mouse. H. Schütze.—p. 457.

Incidence and Significance of Haemophilus Influenzae in Chronic Bronchiectasis. P. R. Allison, J. Gordon and K. Zinnemann.—p. 465.

Action of Chemotherapeutic Drugs (Including Proflavine) and Excipients on Healthy Tissue. F. R. Selbie and J. McIntosh.—p. 477.

Primary Carcinoma in Mice Following the Intranasal Administration of Methylcholanthrene. J. W. Orr.—p. 483.

Production of Penicillin.—According to Challinor and MacNaughtan increased yields of penicillin have been obtained by the addition of large amounts of phosphate buffer salts to the Czapek-Dox medium, and there was less variation in individual cultures in any one batch. These results obtained with six different strains of *Penicillium notatum*. In ten days' incubation the average concentration of antigenic substance was 6 units per cubic centimeter of culture compared with about 2 units on the original modified Dox medium. Higher yields (6 to 10 units per cubic centimeter) have been obtained in a few experiments using a selected strain of *Penicillium notatum*. In a few experiments increased yields of the antibacterial substance were obtained in the presence of calcium carbonate. Less variation was observed in the buffered medium, and for this and for the extraction and concentration of the active principle.

Lancet, London

2:689-720 (Dec. 4) 1943

Mobile Neurosurgery in Warfare: Experiences in Eighth Army's Campaign in Cyrenaica, Tripolitania and Tunisia. K. Eden.—p. 689.

Concept of Psychosomatic Affection. J. L. Halliday.—p. 692.

Trichlorethylene—Air Analgesia in Childbirth: An Investigation with a Suitable Inhaler. A. Freedman.—p. 696.

Bleeding Gums and Gingivitis in Naval Ratings. A. C. MacDonald.—p. 697.

*Bacteriologic Investigations in a Mass Chest Survey. J. W. Bigger.—p. 699.

Conduction Time for Human Pain Sensation. G. Gordon and D. Whitteridge.—p. 700.

Bacteriologic Investigations in Chest Survey.—Bigger states that Kerley carried out a preliminary miniature radiography survey of army personnel. When a miniature film showed any abnormality, full-size films were made. Radiologically suggested persons were admitted to the hospital, where they were investigated clinically. Of the 5,737 examined radiologically, 20 were referred to Bigger for bacteriologic investigation. The plan was to examine, from each patient, 10 specimens of sputum microscopically (direct and after concentration), 3 specimens of sputum by culture and 3 specimens of fasting gastric juice by culture. Bacteriologic methods established the diagnosis of active pulmonary tuberculosis in 13 cases. In all the 10 cases in which active pulmonary tuberculosis was suspected or actually diagnosed on radiologic and clinical grounds, the diagnosis was confirmed bacteriologically. In addition, tubercle bacilli were demonstrated in 2 cases with radiologic evidence of healed lesions and with no clinical signs of activity and in cases in which no radiologic or clinical evidence of pulmonary tuberculosis was found until some time after the bacteriologic diagnosis had been made. The author concludes that culture of both sputum and fasting gastric juice has been shown to be a practicable, valuable and early diagnostic method.

Medical Journal of Australia, Sidney

2:309-328 (Oct. 16) 1943

Rheumatic Infection in Childhood: Survey from Children's Hospital, Melbourne. G. E. M. Scott.—p. 309.

*Human Infection with Virus of Newcastle Disease of Fowls. F. M. Burnet.—p. 313.

Extraction of Cataract in Its Capsule (Total Extraction). R. A. de Castro Basto.—p. 314.

Human Infection with Fowl Virus.—According to Burnet it was recently reported that the virus of Newcastle disease of fowls shows a number of close resemblances to the human influenza viruses A and B. It becomes of interest therefore to report the occurrence of an accidental laboratory infection with this virus as indicating its potential human pathogenicity. Newcastle disease is an acute, highly infectious and highly fatal disease of fowls. The present infection was the result of a fairly large amount of highly infectious allantoic fluid being squirted from an egg into the right eye. The egg had been inoculated allantoically, with material containing both Newcastle disease virus and influenza B in the course of experiments to detect possible "blockade" effects between the two viruses. The embryo was dead with typical Newcastle disease lesions. The following morning (December 17) the eye was severely inflamed. In the evening of December 17 moderate general symptoms were present. There was much mucopus, and free lacrimation occurred; about 0.25 cc. of fluid was collected with a pipet from the outer canthus. A filtrate of this was inoculated amniotically into four 12 day chick embryos; the filtrate produced death with typical lesions of Newcastle disease. Fluid from these embryos agglutinated fowl red cells, and the agglutination was inhibited specifically by anti-Newcastle disease virus immune serum. The original filtrate stored meanwhile in the refrigerator was diluted serially and inoculated allantoically into 12 day chick embryos. After three days all embryos inoculated with dilutions 1:10 and 1:100 were dead. There can be no doubt that Newcastle disease virus was actively multiplying in the eye and must be presumed directly responsible for the infection. Although it is possible that the coexistence of influenza B virus in the inoculum helped the establishment of infection, the evidence presented is sufficient to establish Newcastle disease virus as the agent responsible for an acute conjunctivitis with moderate symptoms of general toxemia in a human subject.

usually frees the patient of trichomonads. Instillation of 1 per cent gentian violet by catheter seems helpful. Massage of the prostate should be used as indicated. Since infection with trichomonads is accompanied by a discharge, irritation and symptoms similar to those of gonorrhea, it may have to be regarded as another venereal disease, the seventh venereal disease.

Southwestern Medicine, Phoenix, Ariz.

27:267-296 (Nov.) 1943

- Federal Medical Legislation. M. P. Spearman—p. 270.
Vomiting During First Days of Life. E. H. Running—p. 271.
Electroshock in Oral Cavity. Case Report. M. L. Kent—p. 276.
Menstrual Problems of Adolescence. G. Heusinkveld—p. 277.

Surgery, St. Louis

14:807-958 (Dec.) 1943

- *Surgical Treatment of Recurrent Inguinal Hernia with Special Reference to a Cooper's Ligament Herniotomy and the Use of Free Fascial Grafts. S. A. Swenson and H. N. Harkins—p. 807.
Study of Recurrences Following Inguinal Hernioplasty, with Report of New Operation. H. E. Stein and D. Crsten—p. 819.
Surgical Treatment of Carcinoma of Papilla of Vater. H. K. Gray and W. S. Sharpe—p. 831.
Chronic Constrictive Pericarditis. J. E. Strode and S. E. Doolittle—p. 847.
Recurrent Postoperative Atelectasis. Report of Case. H. T. Thompson—p. 866.
Treatment of Abscess of Thyroid Gland Causing Tracheal Obstruction. W. H. Prioleau—p. 871.
Impression Technic for Reconstruction of Large Skull Defects. E. S. Gurdjian and J. C. Brown—p. 876.
Congenital Atresia of Esophagus. Description of an Operative Procedure. E. J. Poth—p. 882.
Experimental Studies on Alimentary Azotemia. IV. Role of Liver and Kidneys. H. N. Harkins, D. H. Hooley, R. T. Boals, B. E. Brush and C. F. Chunn—p. 891.
Clinical Study of Relative Efficiency for Nitrogen Metabolism of Casein Digest Administered Intravenously and Protein Ingested by Mouth. A. Brunshwig and Nancy Corbin—p. 895.
Varicose Veins. New Technic Resulting in Rapid Obliteration of Venous Channels Without Formation of Usual Large Thrombi. M. B. Pearce—p. 901.
Synthetic Vitamin K and the Thrombosis of Veins Following Injury. C. B. Morton, E. W. Shicaburn and R. E. Burger—p. 915.
Acute Diverticulitis of Jejunum—Case Report. F. F. Rudder—p. 921.
Tumors of Salivary Gland Origin. So Called Mixed Tumors. G. F. Robbins—p. 924.
Some Studies with Zephuran, with Particular Reference to Its Use in Time of War. H. B. Shumacker Jr and W. R. Bethel Jr—p. 931.

Recurrent Inguinal Hernia.—Swenson and Harkins review the factors involved in the recurrence of inguinal hernia and present the application of the McVay modification of the Lotheissen operation for femoral hernia to recurrent inguinal hernia. This procedure utilizes Cooper's ligament instead of Poupart's ligament. The authors also discuss the use of free fascia grafts in recurrent inguinal hernia. They present a series of 37 consecutive operations for recurrent inguinal hernia, most of which were performed with the use of free fascial grafts or a Cooper's ligament (McVay) herniotomy. No recurrences of hernia have been noted to date in the cases which the authors have followed.

Impression Technic for Reconstruction of Skull Defects.—Gurdjian and Brown describe an impression technic for the building of inanimate transplants for large skull defects. They report a case in which a large bone flap had to be sacrificed because of severe edema, following removal of a malignant meningioma, from a woman aged 21. Plexiglass (methylnmethacrylate) was used to cover the bone defect. At the end of fifteen months the plexiglass transplant was still in excellent repair, with no evidence of deleterious reactions to the patient.

Texas State Journal of Medicine, Fort Worth

39:415-460 (Dec.) 1943

- Clinical Aspects of Arterial Hypertension. W. S. Horn—p. 421.
Mental Hygiene. R. L. Hall—p. 426.
Medical Witness. P. R. Denman—p. 428.
Review and Revaluation of the Surgery of the Ptoised Colon. K. H. Ayneworth—p. 430.
Bilateral Oophorectomy in Pregnancy. B. Farfel—p. 432.
Surgical Management of Cholecystitis. J. D. Becton—p. 433.
Bilateral Plastic Operations for Congenital Hydronephrosis. Case Report. R. S. Mallard—p. 435.
Summary of Results Obtained in Fifty-Five Cataract Operations Performed in 1942. W. E. Vanderveer—p. 439.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Surgery, Bristol

31:101-204 (Oct.) 1943

- Anatomy at Barber Surgeons' Hall. H. Lett—p. 101.
Surgical Experiences in Middle East (1941 to July 1942). St. J. D. Buxton—p. 111.
Etiology of Appendicitis. W. H. Bowen—p. 127.
*Methods and Results of Treatment in Cases of Paralysis of Bladder Following Spinal Injury. E. W. Riches—p. 135.
Case of Fibromyoma of Epididymis in an Undescended Testicle. G. Gordon Taylor—p. 146.
Orbital Tumours. A. E. Iles and A. R. Short—p. 147.
Webbing of Neck, with Turner's Syndrome in Male. G. Flavell—p. 150.
Bilateral Pulmonary Hydatid Cysts. A. L. d'Abreu and L. Rogers—p. 153.
Popliteal Aneurysm, with Report of Case. G. L. Keynes and M. P. Morel—p. 155.
Malignancy of Testicular Cancer in Man and Dogs. J. R. M. Innes—p. 157.
Repair of Ruptured Popliteal Artery, with Note on Heparin Therapy After Arterial Suture. G. F. Langley—p. 161.
*Cysts of Epididymis, the So Called Spermatocoele. C. P. G. Wakeley—p. 165.
Inguinal Hernia. H. Edwards—p. 172.
Cervical Rib Syndrome Associated with Contracting Lesion of Apex of Right Lung. A. L. d'Abreu—p. 185.

Treatment of Paralysis of Bladder Following Spinal Injury.—According to Riches the total death rate from urinary sepsis in spinal injuries during the last war was 80 per cent. This report is based on a study of 35 cases treated in England during the present war. The stages through which the bladder passes after spinal lesions are (1) complete retention, (2) retention with overflow and (3) periodic reflex micturition. In partial lesions a state of voluntary micturition, indistinguishable from the normal, may follow directly from the first or second stages. A summary of the final state of micturition up to two years from the onset of the lesion shows that, of 33 patients with bladder paralysis, 30 per cent were left with permanent drainage by suprapubic cystostomy or urethral catheter and 70 per cent passed urine by the normal channel either voluntarily or by periodic reflex. The main obstacle to the attainment of a satisfactory act is urinary infection, which may cause death or permanent disability and is introduced by urethral catheterization. Urethral catheterization should be forbidden. The relief of retention is not an urgent matter. Overflow incontinence is a safe solution but may produce pressure sores. If retention must be relieved the alternatives which are safer than a urethral catheter are suprapubic aspiration, suprapubic catheterization and suprapubic cystostomy. Suprapubic catheterization can be combined with tidal drainage after two days. Any suprapubic opening must be made high and water tight. The patient should be transferred to a special center, for only at such a center, or in a well equipped hospital, should urethral catheterization be allowed. It should be reserved for mild cases and limited to two days. If there is no recovery after two days, suprapubic catheterization is indicated with subsequent tidal drainage. Tidal drainage with an indwelling urethral catheter should be used only by a staff that has special experience. There should be no delay in replacing it by suprapubic catheterization if inspection of the urine shows infection.

Cysts of Epididymis.—During the last twenty-five years Wakeley has treated 34 cases of epididymal cysts, 22 of which contained spermatozoa. The usual type of spermatocele is a retention cyst of the epididymis found at the upper pole of that organ. It is usually single and varies in size from that of a cherry to that of an orange. The swelling is cystic and translucent. Translucency is always present, but it varies in degree. The degree of opalescence is not dependent on the number of spermatozoa in the fluid. The correct treatment of a cyst of the epididymis large enough to cause symptoms is complete excision. Injections of sclerosing fluids may prove successful in a few cases, but they may convert a simple unilocular cyst into an adherent multilocular one. The author operates on hydroceles through the scrotal integument and sees no valid reason why this direct approach should be condemned and an indirect approach through an inguinal incision used. The cyst

is a major aim of this book." The style and material necessarily are adapted to the understanding of the lay reader. The author has made his subject extremely lucid; his book will be widely used in medicolegal and industrial board proceedings. The material is fairly complete and accurate. There is a satisfactory bibliography and index, and the illustrations are clear. The book is too elementary for use by specialists in the field.

The Youngest of the Family: His Care and Training. By Joseph Garland, M.D., Physician to Children's Medical Department, Massachusetts General Hospital, Boston. Second edition. Cloth. Price, \$2. Pp. 182, with 11 illustrations. Cambridge, Massachusetts: Harvard University Press; London: Oxford University Press, 1943.

This excellent compact manual for the inexperienced mother was revised by Dr. Garland after a decade because the stress of present circumstances necessitated it. "There are more babies now than ever before, and fewer doctors to attend them. Babies are being hurried from one end of the country to the other, from camp to cantonment, and from flying field to port of call." His advice is concise and brief, at times almost laconic. The illustrations are timely; for example, the two close-up illustrations on strapping a protruding navel are so helpful that almost any intelligent mother could do it herself without any other assistance. Throughout, the author's skill as an exceptionally experienced pediatrician is manifest. He constantly adheres to the tried and proved methods. There is an absence of any fads. The book may be recommended especially to the educated mother suddenly thrown on her own resources. She should not only enjoy reading it but find it rather easy to follow in many trials which she and her infant are at present encountering.

White Blood Cell Differential Tables. By Theodore R. Waugh, B.A., M.D., C.M., Pathologist-in-Chief, Royal Victoria Hospital, Montreal. Fabrikoid. Price, \$1.60. Pp. 126. New York & London: D. Appleton-Century Company, Inc., 1943.

In recent years there has been an increasing appreciation by clinicians and laboratory workers that the finer diagnostic value of the differential white count resides in the absolute number of each cell type present rather than the relative values of the different forms. It is customary in many laboratories to report the differential in terms of the actual number of polymorphonuclears, lymphocytes, monocytes and eosinophils instead of the traditional differential percentage figures. The method is of particular significance during infancy and childhood and under pathologic conditions of leukopenia and leukocytosis. The absolute value for each cell type is obtained from the conventional differential count by multiplying the percentage found with the total count. The author has prepared a set of convenient tables for the rapid computation of the actual number of each cell type of white cell per cubic millimeter of blood. The use of the tables is explicitly stated by the author, and examples of how they are practically applied are set forth. The novice will also benefit from the terse introductory notes on white blood cell and differential counting. The pathologist, the hematologist and the technician will welcome these convenient tables, and clinicians interested in interpreting hemograms will also find them of value.

The Hospital in Modern Society. Edited by Arthur C. Bachmeyer, M.D., Director, University of Chicago Clinics, and Gerhard Hartman, Ph.D., Director, Newton Hospital, Newton Lower Falls, Mass. Cloth. Price, \$5. Pp. 768. New York: Commonwealth Fund; London: Oxford University Press, 1943.

This volume is a collection of leading articles that have appeared in the periodical literature of the hospital field during the last decade. It represents the views of many distinguished authors whose articles have been selected because of their general interest and adaptability to present day problems. Ninety-eight authors have contributed to this book, including twenty-six hospital administrators and seventy-two from allied professional groups. Their material has been carefully arranged in twenty-nine chapters covering a total of one hundred and forty-five articles, which are of particular interest to hospital superintendents, administrative assistants, department heads, students and others who wish to broaden their knowledge and understanding of the principles of hospital organization and management. Broad in scope and well balanced, the book

encompasses all major activities of the hospital administrative field. It offers first a general historical review and then turns promptly to the practical aspects of administrative organization, medical staff relationships, nursing education, departmental services, medical records, hospital construction and maintenance, financial and legal matters, personnel, public relations, group hospital insurance and various subjects pertaining to public health. Many important articles that could not be included because of lack of space have been listed in the bibliographic references that accompany each chapter. Thus the reader is afforded a further opportunity to explore the literature of the hospital field. The book itself, however, has successfully crystallized into convenient form much of the material that was formerly widely dispersed and not readily available for study and reference.

The Genealogy of Gynecology: History of the Development of Gynaecology Throughout the Ages 2000 B. C.—1800 A. D. with Excerpts from the Many Authors Who Have Contributed to the Various Phases of the Subject. By James V. Rice, A.B., M.D., Associate Clinical Professor of Gynaecology and Obstetrics, New York Medical College, New York. Fabrikoid. Price, \$8.50. Pp. 578, with 54 illustrations. Philadelphia: Blakiston Company, 1943.

This volume is devoted particularly to the history of the diseases of women as a special branch of medicine. The author takes up the subject chronologically, beginning with the prehistoric period. The first plate in the book is startling, since it shows the development of the vaginal speculum from 79 A. D. to 1821. The author has made reference to most of the widely known theses and books, although he does not yet seem to have solved the secret of Trotula, who was alleged to be the chief woman physician in the school of Salerno. The basic facts of this mystery are, however, recorded on page 243. Some people insist that there was no such person, whereas another writes that she was followed by a procession of mourners 2 miles long when she was buried. The book contains much that is of interest not only to the gynecologist but to all with even a casual interest in the history of medicine.

Rehabilitation of the War Injured: A Symposium. Edited by William Brown Doherty, M.D., and Dagobert A. Runes, Ph.D. Cloth. Price, \$10. Pp. 684, with illustrations. New York: Philosophical Library, 1943.

This volume is composed of essays selected from a variety of publications and grouped here in order to make a quickly available volume on rehabilitation of the war injured. There has been no attempt to modify or edit the individual articles to prevent duplication of material, nor is there unity of approach to the subject or even completeness in any one field. Most of the illustrations, which presumably are halftones made from halftones, are miserably reproduced. The volume begins with neurology and psychiatry, then takes up plastic surgery, orthopedics, physical therapy, occupational therapy, the legal aspects of rehabilitation and a final chapter on the lesions associated with shipwreck. For a book thus thrown together it comes out somewhat better than might have been expected.

Psychology You Can Use. By William H. Roberts. Diagrams by James Macdonald. Cloth. Price, \$2. Pp. 246, with illustrations. New York: Harcourt, Brace and Company, 1943.

The whole mechanistic psychology is the basis of this book, which apparently includes some small essays spaced out and printed in large type for purposes of publication. There is no reference to Sigmund Freud or psychoanalysis, although Alfred Adler gets a brief mention. There is a little something on remembering and forgetting that is quite inadequate. Altogether the book is hardly worth while.

Microscopic Technique in Biology and Medicine. By E. V. Cowdry, Professor of Anatomy, Washington University, Washington, D. C. Cloth. Price, \$4. Pp. 206. Baltimore: Williams & Wilkins Company, 1943.

This is essentially an encyclopedia of data on the subject that it concerns. In alphabetical order comes a list of all the terms which might interest the worker with the microscope, including stains, apparatus, anatomic appearances, solutions and methods. In most instances a brief definition is followed by a concrete description and a bibliographic reference. Certainly the usefulness of the book is apparent.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

EFFECT OF FLUORESCENT LIGHTING ON THE EYES

To the Editor:—The Technical Advisory Service of the Smaller War Plants Corporation (a federal agency created by Congress under the Small Business Act) is endeavoring to assist the small business man in obtaining, from sources especially qualified in their respective fields, solutions to problems that are confronting him. A municipally owned public utility in the city of Seattle has submitted the following inquiry, and your assistance in its behalf will be appreciated: From people who work in a sitting or fixed position as in offices and drafting rooms, complaints of eye fatigue from fluorescent lighting are fairly common. In order that we may correctly answer these inquiries and complaints, will you please supply the following information: 1. The tube is bright and also dark 120 times a second. This speed "fools the eye," so that the tube has the appearance of burning (being bright) all the time. Does this speed also "fool the nerves" leading to the eye or are they fast enough to sense this dark and bright effect and try to make adjustments for it? (a) If so, would this cause a noticeable fatiguing of the eye? (b) Would this cause any permanent injury to the eye? 2. Does the color, temperature or the light spectrum peculiar to this light fatigue injure the eye? 3. Is there a band of energy, e. g. ultraviolet, that is being transmitted through the powders and glass which affects the eye? 4. Pertaining to the eye only, is there anything inherently wrong with this light source? 5. If the problem is purely psychic, will the eye soon condition itself to this new and different light source?

William C. Brown, Seattle.

Consultant, Technical Advisory Service, Smaller War Plants Corporation.

ANSWER.—1. Fluorescent tubes require alternating current. Alternating current is usually 60 cycles, sometimes 25 cycles per second. Each time the current changes its direction there is an infinitesimal pause when no current is flowing. The duration of the pause is a small part of the cycle and is not long enough for the lamp to cool off and become dark. It merely becomes a little less light. When plotted as a curve is not a straight line but wavy (a sine curve). It is gross exaggeration to speak of this as being "bright and also dark 120 times a second," when really it is bright and slightly less light, not dark. The lowest part of each wave is far above the abscissa, which is zero or darkness. How the eye reacts to this type of illumination depends on what it is looking at. Looking at a small area such as a book on the desk or a picture projected on a screen, the sensation produced by a very short exposure persists for an appreciable time. If the images are projected as in ordinary amateur motion picture projectors, sixteen per second, the pause between two successive images is so short that the sensation persists from one to the next and no flicker may be noticed. With the professional projectors the speed is about twenty-five or more per second and there is still less flicker. This presupposes that the successive images fall on the same area of the retina.

If they do not, then an entirely different effect is produced. The successive images fall on a series of different areas of the retina and each area will give its separate sensation. Each will persist long after the next is initiated, and so a string of separate images is seen. If the object is a small light, a string of lights is seen. This can happen when the object moves rapidly across the field of vision or it can happen when the object is stationary but the eye moves its visual line across the field of fixation. In either case the successive images will stimulate not the same area of the retina but a series of areas, whose separation will depend on the speed of the movement.

The way it works out in practice is this: When the work to be done involves little extensive movement, as is the case in reading or writing, no flicker is noticed; but if there is rapidly moving machinery or the like, the movement will not be smooth and continuous but jerky in rapid steps or if the work involves shifting the gaze rapidly from one part of the field to another there may be an annoying, jerky, flicker sensation. This is readily demonstrated with light pulsating even as rapidly as 250 and more times per second, with which absolutely no flicker would be observed in steady looking because the images would fall on the same area of the retina.

There is a very effective way to eliminate all stroboscopic or flicker effect with fluorescent tubes, making them far steadier than any other light on alternating current, and that is by combining the tubes in pairs, so coupled that the maximum of one tube corresponds with the minimum of the other, thus compensating for the flicker. These tubes have been in use for some years now and are very satisfactory. Only the high power (40 to 100 watt) tubes are so made, not the 25 watt.

To answer the specific questions:

(a) Whether the pulsating character of the fluorescent tube would "cause noticeable fatiguing of the eyes" would depend on the kind of work. For ordinary reading or writing involving no extensive rapid movements of the eye or of the work itself, no stroboscopic effect would be produced. The light would act like any other light. If the work involved rapid shifting of the gaze from one side of the desk to the other, an annoying flicker might be produced which would irritate and fatigue the eyes. This would be completely abolished if the double tubes were used.

(b) It would cause no permanent injury to the eye.

2. No. The ordinary regular fluorescent lamp is of excellent color and does not fatigue or injure the eyes. Tubes of special colors, including daylight, are not as good as the regular.

3. No. There is no ultraviolet radiation from the fluorescent lamp which enters the eye.

4. There is nothing "inherently wrong with this light source."

5. The problem is not "purely psychic." Like all other sources of light, the fluorescent lamps must be properly used so as to give enough light properly distributed, i. e. free from glare. The secret of good lighting is not in the selection of some special type of lamp but in the proper arrangement of the type chosen. It is ten to one that the source of the trouble complained of is the way the fixtures are installed—the amount and distribution of the light.

CLINICAL VALUE OF SERUM ACID PHOSPHATASE DETERMINATIONS

To the Editor:—What is the real significance in differentiating alkaline and acid phosphatase and the importance for differential diagnosis? None of the papers published recently clearly differentiate this point. I was especially confused by the following statement in one of the recent articles (Sullivan, T. J.; Gutman, Ethel Benedict, and Gutman, A. B.: *Theory and Application of the Serum Acid Phosphatase Determination in Metastasizing Prostatic Carcinoma: Early Effects of Castration*, *J. Urol.* 48:426 [Oct.] 1942) on prostatic carcinoma and phosphatase activities: "We have found an adaptation of the King and Armstrong method for alkaline phosphatase satisfactory for the estimation of serum acid phosphatase activity." Could you recommend a book that deals only with sources of errors in laboratory tests?

M.D., Ohio.

ANSWER.—Serum acid phosphatase determinations have been shown to be of clinical value primarily in one condition, namely in metastasizing prostatic carcinoma, where the values may be enormously increased. Acid phosphatase occurs in and is apparently elaborated by the acinar epithelium of the prostate gland. The concentration of the enzyme is high in adult human prostate tissue and in the prostatic secretion. When carcinomatous prostate tissue metastasizes, invasion of lymph or blood channels is accompanied by escape of the prostatic secretion into the circulation, thus raising the acid phosphatase content of the blood serum. In such cases an increase in the serum acid phosphatase has been found to be an important diagnostic aid, while a subsequent decrease is an excellent guide to the anti-androgen therapy now advocated. Serum alkaline phosphatase values are increased primarily in diseases involving the skeleton, such as Paget's disease, rickets, hyperparathyroid disease, osteomalacia, osteogenic sarcoma and other tumors primary in the skeleton. It is generally considered that serum acid phosphatase shows optimum activity at pH 5.0 and the serum alkaline phosphatase at pH 9.3.

The clinical significance and usefulness of the phosphatases have been reviewed in two recent papers (Sunderman, F. W.: *Recent Advances in the Significance and Interpretation of Phosphatase Measurements in Disease*, *Am. J. Clin. Path.* 12:404 [Aug.] 1942, and Jaffee, H. L., and Bodansky, Aaron: *Diagnostic Significance of Serum Alkaline and Acid Phosphatase Values in Relation to Bone Disease*, *Bull. New York Acad. Med.* 19:831 [Dec.] 1943). In addition to the paper cited in the query, Alexander B. Gutman presented an excellent discussion (Serum "Acid" Phosphatase in Patients with Carcinoma of the Prostate Gland: Present Status) in *THE JOURNAL*, Dec. 5, 1942, page 1112. The Gutmans described their modification of the King and Armstrong method sometime ago (Gutman, Ethel Benedict, and Gutman, A. B.: *Estimation of "Acid" Phosphatase Activity of Blood Serum*, *J. Biol. Chem.* 136:201 [Oct.] 1940). The subject is too recent and specialized to expect adequate discussion in books on laboratory diagnosis. There is no book dealing exclusively with sources of error in laboratory tests. However, methods are given and briefly discussed in the following recently revised textbooks:

- Levinson, S. A., and MacFate, R. P.: *Clinical Laboratory Diagnosis*, ed. 2, Philadelphia, Lea & Febiger, 1943, pp. 328-332.
 Gradwohl, R. B. H.: *Clinical Laboratory Methods and Diagnosis*, ed. 3, St. Louis, C. V. Mosby Company, 1943, vol. 1, pp. 303-310.

NONTROMBOPENIC PURPURA

To the Editor:—A white woman aged 59 is suffering from a hemorrhagic condition. Six months ago she had a rather serious epistaxis, and since that date bleeding from various organs has occurred. She gets subcutaneous hematomas from the slightest bruises. She had a rather severe hemorrhage from the kidneys a few weeks ago simulating acute nephritis. Her condition grew gradually worse. At present hemorrhage is occurring from the upper eyelids and gums, besides severe epistaxis. She has had seven deliveries and four miscarriages, one delivery being by cesarean operation. She was treated in 1941 for high blood pressure; otherwise the medical and surgical history is negative. She never had a hemorrhagic condition before. The patient is obese, the heart is slightly enlarged to the left and there is a loud systolic murmur. The blood pressure varies from 140 to 200 systolic and 80 to 110 diastolic. The latest blood pressure taken was 160/90. The pulse is regular, 76. The red blood cell count is 4,120,000, hemoglobin 75 per cent Sahli, white blood cell count 7,900 with 88 per cent polymorphonuclears and 12 per cent lymphocytes. The clotting time is 6 minutes, the bleeding time 1½ minutes; thrombocytes number 225,000. The probable diagnosis is thrombopenic purpura. There is apparently a high fragility and increased permeability of the capillary blood vessels. I have read quite a few articles about good results obtained in similar cases with vitamin P. Could you advise me about the commercial availability and dosage of this preparation, or could you advise me of any other course of treatment? Parenteral calcium and ascorbic acid 200 mg. daily has been tried without results.

William E. Sag, M.D., Alliance, Ohio.

ANSWER.—With the evidence available, about the only diagnosis that can be made in this case is idiopathic nontrombopenic purpura. Determinations of the blood prothrombin and fibrinogen and a study of the clot retraction should be made. Vitamin P has been used in these cases, but the results are not conclusive. It is given in the form of crude hesperidin 4 to 5 Gm. daily. It is not commercially available at the present time.

Outside of blood transfusions there is no established treatment in this type of purpura. Attention has been called recently to the beneficial effect of splenic irradiation on the increased vascular erythropermeability in both thrombopenic and nontrombopenic purpura (Madison, F. W.; Squire, T. L., and Morton, S. A.: *Proc. Cent. Soc. Clin. Res.* 16:12, 1943). Satisfactory response to irradiation would suggest that splenectomy might also be beneficial.

VIABILITY OF OVA AND SPERMATOZOA

To the Editor:—In "Queries and Minor Notes" in The Journal, Oct. 23, 1943, the answer to a question contains the statement that "an ovum lives for only about twenty-four hours, and unless it is fertilized within this time it dies. Spermatozoa are capable of fertilization for forty-eight to seventy-two hours." Would you kindly let me know on what evidence these answers rest?

Frances I. Seymour, M.D., New York.

ANSWER.—Some of the evidence on which the answer rests is as follows:

F. P. Mall (*Am. J. Anat.* 22:49, 1917, 23:397, 1918) spoke of a twenty-four hour difference between what he called "copulation age" and "fertilization age." Dr. Mall believed that the ovum is not capable of fertilization for more than one day.

C. G. Hartman (*Am. J. Obst. & Gynec.* 7:40 [Jan.] 1924) says "The egg cannot wait long for the spermatozoa . . . these must be on hand when ovulation takes place. It seems probable that hours, not days, measure the delay that results in sterile coitus."

C. G. Hartman (*Time of Ovulation in Women*, Baltimore, Williams & Wilkins Company, 1936, p. 37) says "We know now that fertile coitus and fertilization must be always synchronous, inasmuch as the unfertilized eggs live but a few hours and sperms most likely less than a day, within the female organs."

O. Grosser (*Biol. u. Path. d. Weibes*, Halben and Seitz, Berlin and Vienna, Urban and Schwarzenberg 6:1, 1925) believes that the time of coitus, ovulation and fertilization practically coincides in all mammals studied, and the same most likely applies to human beings. Grosser also maintains that human sperm are not capable of fertilization for more than one or two days under normal conditions. In mammals, if fertilization does not take place within twenty-four hours, the ovum degenerates.

Emil Novak (*Gynecology and Female Endocrinology*, Boston, Little Brown & Co., 1941, p. 445) says "The life of the ovum after its extrusion from the follicle is very short, probably not more than a day or so and, according to some, only a few hours." Also "The evidence now seems quite clear that while they [spermatozoa] may retain their motility longer they lose their capacity to fertilize the ovum in about thirty hours."

K. Ogino (*Zentralbl. f. Gynäk.* 56:721 [May 19] 1932) says that, on the basis of his study with the rhythm method of contraception, sperm are capable of fertilization for only three days. He quotes a similar opinion of fourteen other authorities. Ogino also says "The ovum is capable of fertilization for only

a few hours in mammals and this can now be proved in humans directly by the rhythm method.

L. Latz (*THE JOURNAL*, Oct. 19, 1935, p. 1241) says (a) The life of the sperm cell within the female genitalia is less than forty-eight hours. (b) The ovum can be fertilized for only a few hours after ovulation. This is due mainly to two biologic factors. . . . Shortly before or just during the process of ovulation the first maturation division of the ovum occurs. The second maturation division occurs only when the ovum is fertilized. The time interval between the two mitotic cell divisions is short; a sperm must therefore be at hand to serve as a life saver of the ovum. Secondly, soon after the last follicle cells have fallen away from the ovum after its rupture the smooth surface covers itself with a sheath of albumin as it travels through the tube. This albumin sheath . . . offers a successful resistance to the penetration of the spermatozoa." Latz believes that the success of the rhythm method depends on the foregoing facts. Clinical evidence seems to bear out the foregoing statements because of (1) the high incidence of success of the rhythm method, (2) the success of mating of animals not only on the farm but also in monkeys (van Wangen and Newton: *Surg., Gynec. & Obst.* 77:539 [Nov.] 1943) and (3) artificial insemination in domestic animals.

ANAPHYLAXIS UNDER ANESTHESIA

To the Editor:—Recently while having a laceration of the hand repaired under ether anesthesia the patient died. Death was respiratory, and the pulse rate did not undergo appreciable change until after the respiratory difficulty began. The patient's physical condition had been excellent prior to surgery. The operation had been in progress for about seventy minutes. Twenty minutes prior to death combined gas-tetanus antitoxin had been administered subcutaneously without a preliminary skin test. There was no history of previous allergy. Complete autopsy revealed acute cardiac dilatation and acute pulmonary edema as the only findings of significance. 1. Do anaphylactic phenomena occur under anesthesia? 2. Is the skin test reliable when performed while the patient is under anesthesia? 3. Would not a serum reaction manifest itself by a change in respiration and pulse rate before twenty minutes had elapsed? 4. Will you please send me references concerning serum reactions in relation to anesthesia if such references be available?

M.D., Kansas.

ANSWER.—1. Whether ether anesthesia protects animals or human beings from anaphylaxis is the major question involved in this history. This question is discussed in great detail in a thorough review and experimental work by L. M. Quill (*Anaphylaxis During Ether Anesthesia*, *THE JOURNAL*, Sept. 11, 1937, p. 854). Quill starts with the work of Besredka, who was the first to suggest that ether anesthesia protects animals from anaphylaxis. He then gives the succeeding work up to 1935, showing the various contradictory reports, and the tendency in most cases for later work to deny the effectiveness of ether anesthesia as a protection against anaphylaxis. Quill reports a case of anaphylaxis under ether anesthesia and mentions another case obtained by questionnaire from one of eight surgical clinics. In addition, this author by experimental work on dogs, guinea pigs and rabbits found that ether anesthesia did not inhibit anaphylaxis.

2. While the skin reaction is not affected by ether anesthesia, it is neither advisable nor practical to do such a test under anesthesia. To avoid the danger of severe horse serum reactions a history of allergy in general should be taken (hay fever, asthma, eczema, urticaria, migraine). More specifically, an inquiry should be made for symptoms resulting from contact with horses. Next an inquiry should be made regarding previous injections of horse serum (antitoxins) and any previous reactions following such injections. The skin test in suspected cases should be done intracutaneously, first with a dilution of 1:1,000 horse serum. The main reason for the impracticability of doing this under ether anesthesia is that the reaction should be observed for fifteen to twenty minutes. If negative a 1:100 dilution and, if necessary, a 1:10 dilution of horse serum should be used successively for intracutaneous testing. The sooner the reaction occurs the more dilute is the solution with which it is obtained, and the larger the wheal the more sensitive is the patient. It must be emphasized, however, that positive skin reactions with horse serum do not necessarily indicate clinical or at any rate dangerously clinical sensitivity to horse serum. The conjunctival test (edema, redness, burning and itching of the conjunctiva) obtained by instilling a drop of horse serum or of the antitoxin into the conjunctival sac is a less sensitive and a safer test. Most authorities consider this test a better index of clinical sensitivity to horse serum than is the skin test.

3. While fatal anaphylactic reactions usually occur more rapidly than indicated in this history, a twenty minute delay in the reaction is not incompatible with the diagnosis of severe or even fatal anaphylaxis.

4. In addition to the literature cited by Quill the monograph by Bret Ratner may be suggested. (Allergy, Anaphylaxis and Immunotherapy, Baltimore, Williams & Wilkins Company, 1943.)

SULFONAMIDES AND AGRANULOCYTOSIS

To the Editor:—A patient developed a severe agranulocytosis as a result of sulfadiazine therapy during an acute attack of what appeared to be bronchopneumonia superimposed on an allergic asthma. Would it be safe to try another sulfonamide such as sulfathiazole or would there be danger of agranulocytosis from the others also?

M.D., Illinois.

ANSWER.—It is now generally agreed that agranulocytosis, with but few exceptions, is caused by drugs which contain the benzene ring in their chemical structure. The precise mechanism whereby these compounds precipitate agranulocytosis is not completely understood, but it probably reflects a state of hypersensitivity induced by the drugs in which the maturation of the granulocytes in the bone marrow is arrested. Although the patient in question developed agranulocytosis as the result of taking sulfadiazine, it does not necessarily follow that the patient would be sensitive to the other commonly used sulfonamides, even though the latter have a benzene ring in common. Nevertheless, in view of the lack of information, another sulfonamide would have to be utilized cautiously. It is of interest that Dameshek and Wolfson (*Am. J. M. Sc.* 203:819 [June] 1942) have proposed the use of sulfathiazole for the treatment of agranulocytosis caused by aminopyrine, which possesses a benzene ring. Large doses of sulfadiazine have been administered successfully to a patient having agranulocytosis due to administration of aminopyrine.

EXAMINATION OF STOOLS FOR BACTERIA

To the Editor:—Is the following laboratory work indicated for a patient being treated with succinylsulfathiazole for chronic ulcerative colitis? Total bacterial count of 0.5 Gm. stool. Count of colon bacilli and non-hemolytic and hemolytic streptococci (if present) as well as other predominating bacteria. If this work is not indicated, why not? If this work is indicated, should it be expected "that a laboratory of a class A 400 bed general hospital do the work"? Please comment.

M.D., Pennsylvania.

ANSWER.—Succinylsulfathiazole is a drug of such low toxicity, whose chief action is local and the absorption of which is so minimal, that the usual blood examinations are indicated only occasionally. The laboratory work necessary for making a bacterial count of the stool periodically is demanding of both time and material. The information obtained by this procedure is limited.

The moment succinylsulfathiazole is discontinued, the bacterial count will return to whatever was the usual normal for the particular individual under consideration. Study of the bacterial count as a means of determining the results of administration of the drug can be considered largely a research problem. Large numbers of patients have received succinylsulfathiazole pre-operatively as well as for the treatment of some form of infectious disease with good results and without periodic bacterial counts of the stools.

SMALL STATURE AND TALIPES EQUINUS IN OFFSPRING

To the Editor:—During the course of examination of a patient a few days ago I came across the following interesting family history: The parents were normal but the mother was only 4 feet (122 cm.) in height. Eleven children had been born of this couple. Six were born with talipes equinus, 3 of them in both feet, 2 in the right foot and 1 in the left. Several of the children died in infancy. The question is whether the size of the mother could account for this high percentage of talipes equinus in the children.

S. Boyd Calkins, M.D., El Rito, N. M.

ANSWER.—Since the cause of congenital talipes equinus is not definitely known, it is impossible to make an absolute statement with regard to whether the height of the mother would account for 6 out of 11 children having the deformity. The familial tendency has been noted and retention of an early uterine position is the most commonly accepted cause of the deformity. This may be the result of some anomaly within the uterus, so that the existence of such an anomaly would predispose to the occurrence of the multiple clubfoot in the same individual, and yet a single clubfoot may occur in a relatively large family with the others normal.

There is no way of establishing that the small stature of the mother would alter the uterus per se, but that there may be a uterine change in this individual that would account for the deformity is possible.

TENDER ABDOMINAL AORTA IN MIDDLE AGE

To the Editor:—I have frequently seen patients with the complaint of abdominal pain, especially in the lower abdomen. This distress is usually not associated with nausea or vomiting and as a rule has no relation to the type of food eaten, to the meal time or to bowel habit. Many have been operated on for appendicitis, only to have temporary relief and then a return of their former complaint of abdominal pain. Analysis of the urine is negative. The temperature is normal. The constant finding on physical examination is tenderness, frequently acute or exquisite in character, over the abdominal aorta both above and below the umbilicus and frequently in thin persons tenderness of or over the common iliac arteries. The latter finding is what, in all probability, prompts the removal of the appendix. For relief I have suggested rest, heat to the abdomen and different analgesics, but these have had little or no effect on the pain. I have tried to think of this condition of pain and tenderness over the aorta and its branches as being an involvement of the sympathetic nerves that lie on it. If there is an entity that this condition may be classified as, I would like to know about it. Also I shall appreciate any suggestions as to therapy. I have considered periarthritis nodosa but do not believe these cases could receive this diagnosis.

Reid P. Joyce, M.D., Ashland, Ohio.

ANSWER.—Yes, there are many women, usually over 40, who have a decidedly tender abdominal aorta. Just why this should be, no one knows. Commonly at necropsy one finds the intima of the abdominal aorta ulcerated from one end to the other. The trouble is that many persons with this type of aorta have no complaint to make during life; they have no abdominal distress. So far as is known, there is no logical or efficient treatment for these tender aortas.

ATROPINE SULFATE FOR RELIEF OF UPPER RESPIRATORY TRACT SYMPTOMS

To the Editor:—A patient with chronic sinusitis and postnasal pharyngitis has for some time received symptomatic relief from bothersome postnasal drainage and salivation on administration of atropine sulfate 1/150 grain (0.0004 Gm.) from once to twice daily. Is there any danger of producing either local harmful effects in the nose and throat or any systemic harmful effects from continuing such dosage indefinitely?

David B. Gregg, M.D., State Park, S. C.

ANSWER.—Atropine sulfate produces symptomatic relief by drying of the mucous membranes of the nose, throat and mouth. This is due to its depressing effect on the parasympathetic nerve endings. Signs of intoxication may appear from a dose as small as 1/60 grain (0.00168 Gm.) of atropine sulfate. Idiosyncrasy is common. Prolonged local use of the drug, as in ophthalmologic conditions, may produce an irritative reaction, possibly of an allergic nature.

Oral or parenteral use of atropine for symptomatic relief in chronic infections of the upper respiratory tract has the basic objection that it does not aid in combating the infection. Excessive drying may interfere with ciliary action, thereby weakening the defense against infection and interfering with drainage from sinuses.

MORPHINE AND PULMONARY EDEMA

To the Editor:—I was prompted by the reply to a question on the use of morphine in pulmonary edema (*Queries and Minor Notes*, Nov. 13, 1943) to call attention to some facts that appear not to be generally recognized. The first of these was well demonstrated in the Coconut Grove disaster by the group at the Massachusetts General Hospital. The observation was reported by Dr. Beecher and his colleagues, who paid special attention to the respiratory injury to these victims and called attention to its similarity to that produced by phosgene. In a number of the casualties who presented manic excitement and had obvious pulmonary irritation and damage the administration of oxygen, which promptly relieved the anoxia, was far more efficient than morphine in relieving the excitement. It was their conclusion that the administration of morphine to such patients was not only useless but also contraindicated, in that it increased the excitement and by depressing respiration contributed still further to the production of anoxia. A further more useful point is a simple procedure for the prevention and treatment of pulmonary edema in patients exposed to a variety of irritant chemical agents capable of producing pulmonary edema, long in use by the Medical Department of Merck & Co., Inc., for the treatment of persons exposed to chlorine, the oxides of nitrogen, phosphorus oxychloride and phosphorus pentoxide, each of which is capable of producing severe pulmonary injury and pulmonary edema if allowed to go untreated or if treated by the usual routine methods. This procedure consists simply in the administration of pure oxygen under atmospheric pressure but forcing the patient to expire against a pressure of from 1 to 6 cm. of water. In some five or six years since this method has been in regular use we have had between 200 and 600 cases each year of pulmonary exposure to these irritants, frequently of a grade sufficient to result in pulmonary edema. In none of these cases so treated has pulmonary edema ever appeared. The method is also applicable in the treatment of established pulmonary edema of severe grades. Whether or not morphine could be safely given to such a patient has not been decided, since there were no reasons for its administration. It would appear, however, that with the administration of pure oxygen in this manner the occurrence of some minimal respiratory depression, as produced by morphine, would not have the same significance it would present in the absence of such definitive and purposive treatment of the pulmonary irritation. D. F. Robertson, M.D., Roselle Park, N. J.

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THE CLINICAL USE OF PENICILLIN

OBSERVATIONS IN ONE HUNDRED CASES

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AND

GLADYS L. HOBBY, Ph.D.

NEW YORK

Following the announcement of the experimental results of the Oxford workers,¹ studies on penicillin were initiated at the Presbyterian Hospital in the autumn of 1940 and have been carried forward continuously up to the present time. The results of the biologic and chemical phases of the investigation have been reported from time to time elsewhere.² In the early stages of the work little attention was paid to the clinical aspects of the problem because of difficulties encountered in producing quantities sufficient for therapeutic purposes and because of the desire to utilize such material as became available for chemical and experimental studies. Enough material was produced, however, to demonstrate that the product was essentially nontoxic for man, and a limited number of patients were treated both locally and systemically.

For preliminary clinical trial, cases of subacute bacterial endocarditis were selected because of the known refractoriness of this disease to other methods of treatment and because many strains of *Streptococcus viridans* were shown to be susceptible to penicillin "in vitro." It soon became apparent that penicillin, as prepared in our own laboratories, was harmless except for occasional instances of pyrexia and that temporary improvement in the patient's condition with reduction in the number of colonies in the circulating blood could be effected. In no case, however, were the beneficial effects observed other than temporary, and treatment

of cases of this disease was therefore abandoned until such time as larger supplies might become available. In the light of subsequent work it became obvious that the amount of penicillin given in this early group of cases was totally insufficient to secure a significant result.

During this stage of the investigation 3 cases of acute pneumococcic endocarditis came under observation. Since it was known that pneumococci were much more sensitive to penicillin than strains of *Streptococcus viridans* and since all 3 cases proved completely refractory to sulfonamide therapy, they were treated as intensively as possible. In 2 instances there was a dramatic temporary improvement with sterilization of the blood stream for a period, but both patients ultimately succumbed to their infection.

The first of these 2 cases was treated in March 1942. A man aged 53 was apparently recovering uneventfully from a lobar pneumonia (type 7) when he developed a septic temperature. Sulfonamide therapy in adequate dosage failed to improve the situation and a blood culture revealed 650 colonies of pneumococcus (type 7) per cubic centimeter. The patient was given approximately 10,000 units of penicillin every three hours, intravenously. Within twenty-four hours an astonishing improvement in the clinical condition was observed. There was a change from a comatose state to one of mental alertness, the temperature returned to normal and a blood culture taken at the end of the first day was negative. Improvement continued for a further period of forty-eight hours, but the supply of penicillin available was so limited that it was necessary to reduce the dose to 5,000 units every three hours. At the end of seventy-two hours of treatment there was a recurrence of fever, and a blood culture showed 20 colonies per cubic centimeter. The dose of penicillin was again increased to 10,000 units every three hours, and this was followed by a satisfactory improvement in the clinical condition. A negative blood culture was obtained a second time. However, after a further period of forty-eight hours the temperature again rose and successive blood cultures revealed an increasing number of colonies. It became obvious that the infection could not be controlled with the amount of penicillin available, and therapy was therefore discontinued.

In the second case of acute pneumococcic endocarditis, similar results were obtained. After the administration of 30,000 units of penicillin by infusion in the first two hours, followed by 10,000 units every four hours for three doses, a negative blood culture was obtained. A total of 175,000 units was given in the first three days and there was temporary improvement in the patient's condition. It became apparent, however, that the infection could not be controlled with the quantity of penicillin available, and therapy was discontinued.

In spite of the failure of penicillin as employed in these 2 fulminating cases of pneumococcic infection, it was felt that temporary sterilization of the blood stream in both instances represented a considerable achievement.

From these preliminary clinical trials it was apparent that, although penicillin was an extremely powerful bactericidal agent and essentially nontoxic, the amount of material necessary for systemic treatment was far greater than that which was available. A number of

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The clinical material for this study was obtained through the courtesy of the attending staffs of the affiliated units of the Columbia-Presbyterian Hospital Medical Center and other hospitals as well as private physicians.

The penicillin used in the preliminary phases of this study was prepared by Dr. Karl Meyer of the Institute of Ophthalmology, Presbyterian Hospital, from material supplied by Charles F. Pfizer and Company of New York. Since August 1942 all penicillin has been provided by the Committee on Medical Research of the Office of Scientific Research and Development under the supervision of the Committee on Chemotherapeutic and Other Agents, Division of Medical Sciences, National Research Council.

1. Chain, E.; Florey, H. W.; Gardner, A. C.; Heatley, N. G.; Jennings, M. A.; Orr-Ewing, J., and Sanders, A. G.: Penicillin as a Chemotherapeutic Agent, *Lancet* 2: 226 (Aug. 24) 1940.

2. Dawson, M. H.; Hobby, Gladys L.; Meyer, Karl, and Chaffee, Eleanor: Penicillin as a Chemotherapeutic Agent, *J. Clin. Investigation* 20: 434 (July) 1941. Hobby, Gladys L.; Meyer, Karl, and Chaffee, Eleanor: Activity of Penicillin in Vitro: Observations on the Mechanism of Action of Penicillin; Chemotherapeutic Activity of Penicillin, *Proc. Soc. Exper. Biol. & Med.* 50: 277, 281, 285 (June) 1942. Meyer, Karl; Chaffee, Eleanor; Hobby Gladys L.; Dawson, M. H.; Schwenk, Erwin, and Fleischer, G.: On Penicillin, *Science* 96: 20 (July 3) 1942. Meyer, Karl; Hobby, Gladys L., and Chaffee, Eleanor: On Esters of Penicillin, *ibid.* 97: 205 (Feb. 26) 1943. Hobby, Gladys L.; Meyer, Karl, and Dawson, M. H.: The Nature and Action of Penicillin, *J. Bact.* 45: 65 (Jan.) 1943. Meyer, Karl; Hobby, Gladys L., and Dawson, M. H.: The Chemotherapeutic Effect of Esters of Penicillin, *Proc. Soc. Exper. Biol. & Med.* 53: 100 (June) 1943. Dawson, Hobby, Meyer and Chaffee.³

local infections, particularly staphylococcal infections of the eye,³ were therefore chosen for topical treatment. Satisfactory results were obtained in several cases and additional evidence gained of the nonirritating nature of the penicillin preparations.

In the meantime the commercial preparation of penicillin under the auspices of the Office of Scientific Research and Development had progressed to the point where material was available for extended clinical trial. Since August 1942 limited quantities have been received through the Committee on Chemotherapeutic and Other Agents of the National Research Council. A general report on the study conducted under the auspices of this committee has recently been published.⁴ The present communication is concerned with observations on the treatment of 100 cases which have been under the senior author's personal supervision.

SELECTION OF CASES FOR TREATMENT

Experimental work had clearly demonstrated that penicillin was primarily effective against gram positive organisms, both cocci and rods, and against gram negative cocci. It was further recognized that effective sulfonamide therapy was available for many infections caused by these organisms. Treatment was therefore largely restricted to those infections in which gram positive organisms and gram negative cocci played a dominant role and in which sulfonamide therapy was known to be ineffective. In addition a number of patients who exhibited definite sensitivity to the sulfonamides were treated as well as a few patients with profound anemia or renal insufficiency in whom sulfonamide therapy appeared to be unwise. As a result of these restrictions, staphylococcal infections constitute by far the largest single group in the present study. It should be emphasized, however, that the amount of penicillin necessary to kill staphylococci is considerably greater than that required for other pyogenic cocci. In general, gonococci and meningococci are the most sensitive, followed by pneumococci and hemolytic streptococci. Strains of *Streptococcus viridans* occupy a position comparable to that of staphylococci. It is therefore apparent that when penicillin becomes generally available its range of usefulness will be greatly extended.

ROUTE OF ADMINISTRATION

For systemic treatment the intramuscular route was chosen in the majority of cases. In the earlier part of the work a number of patients were treated intravenously, but except in very occasional circumstances this route was soon abandoned. It appeared to offer few advantages and several disadvantages. The advantages of the intramuscular route are that (1) a higher concentration is maintained for a longer period of time,⁵ although the initial blood level is not so high as that obtained by intravenous administration, (2) the technique of the injections is simpler and can be carried out by a nurse or qualified attendant and (3) the injections are better tolerated by the patient. Occasionally patients complained of the local irritating effect of the intramuscular injection, but the degree of discomfort appeared to be associated with impurities in the prod-

uct rather than with penicillin itself. With the better preparations the amount of discomfort experienced was minimal.

In instances of general sepsis it may be advisable to administer penicillin by continuous intravenous drip. Further work is required to determine whether the concentrations so achieved are more effective than those obtained by intramuscular injection.

For local treatment penicillin has been administered intrathecally, intrapleurally and intra-articularly. It has also been used for irrigation of sinus tracts and deep wounds and applied as dressings to superficial wounds. Solutions of penicillin have been applied directly to the eye in the form of baths, and relatively high concentrations have been obtained within the eye by iontophoresis.⁶ In 1 case of acute laryngotracheitis in an infant, penicillin was instilled directly into a tracheotomy tube at frequent intervals with satisfactory results.

ABSORPTION AND EXCRETION

Our studies on the absorption and excretion of penicillin⁷ are in general agreement with those reported by the Oxford workers and in greater detail by Rammelkamp and Keefer⁷ and others. These studies show clearly that after intravenous injection penicillin disappears very rapidly from the circulating blood. Within fifteen minutes approximately 75 per cent of the injected material has disappeared and at the end of thirty minutes approximately 90 per cent. The remaining 10 per cent disappears slowly within the next three or four hours. After intramuscular injection the blood concentration rises rapidly, reaching a maximum within fifteen to thirty minutes, remains more or less stationary for the next half hour and then gradually falls off. At the end of three to four hours only traces can be detected in the blood. These observations indicate the advantages of intramuscular administration over intravenous.

After intrathecal administration penicillin has been demonstrated repeatedly in the spinal fluid at the end of twenty-four hours. The same has been shown to be true after both intra-articular and intrapleural administration.

Von Sallmann⁸ of the Institute of Ophthalmology of the Presbyterian Hospital has shown that penicillin enters the aqueous humor of the normal eye in small concentrations within thirty minutes after intramuscular injection. Moderate concentrations are obtained after application of a cup bath to the eye for a period of five minutes, and relatively high concentrations are obtained by iontophoresis. Apparently a different situation exists in the cerebrospinal fluid.⁹ In normal persons little or no penicillin is excreted in the cerebrospinal fluid, but in the presence of active inflammation of the meninges detectable amounts may be found.

It should be emphasized that the methods employed in studying the absorption and excretion of penicillin are necessarily rather crude. The selection of a procedure in which the killing power of blood, or other fluid containing penicillin, is determined against a test organism may give information of practical value in estimating the higher levels of drug desirable in

3. These cases were treated by Dr. Philip Thygeson of the Institute of Ophthalmology with material prepared by Dr. Karl Meyer.
4. Keefer, C. S.; Blake, F. G.; Marshall, E. K.; Lockwood, J. S., and Wood, W. B.: Penicillin in the Treatment of Infections, a Report of 500 Cases, J. A. M. A. 122:1217 (Aug. 28) 1943.
5. Dawson, M. H.; Hobby, Gladys L.; Meyer, Karl, and Chaffee, Eleanor: Penicillin as a Chemotherapeutic Agent, Ann. Int. Med. 19: 707 (Nov.) 1943.

6. von Sallmann, Ludwig: Penicillin and Sulfadiazine in the Treatment of Experimental Intraocular Infection with *Pneumococcus*, Arch. Ophth. 30: 426 (Oct.) 1943.

7. Rammelkamp, C. H., and Keefer, C. S.: The Absorption, Excretion and Distribution of Penicillin, J. Clin. Investigation 22: 425 (May) 1943.

8. von Sallmann, Ludwig, and Meyer, Karl: Penetration of Penicillin into the Eye, to be published.

9. Rammelkamp, C. H., and Keefer, C. S.: The Absorption, Excretion and Toxicity of Penicillin Administered by Intrathecal Injection, Am. J. M. Sc. 205: 342 (March) 1943.

that fluid but give no information regarding the biologic activity of material containing only traces of penicillin. There is reason to believe that this activity is very considerable and of great importance. For example, it can be readily shown that penicillin induces a profound change in the morphology and growth characteristics of hemolytic streptococci in dilutions as high as one part in one billion, far beyond the zone in which either bactericidal or bacteriostatic properties can be demonstrated. Further work is required to determine whether these changes are associated with changes in virulence of the infecting organism and whether they are of clinical significance.

DOSAGE

It was recognized from the beginning of the clinical trials that the establishment of correct dosage and frequency of administration were problems of great complexity. The early experimental work already indicated that different organisms varied greatly in their sensitivity, and more detailed study showed that even different strains of the same organism exhibited wide variations in their susceptibility. In general, strains of gonococcus and meningococcus were found to be most sensitive, followed by pneumococci, hemolytic streptococci (group A), *Staphylococcus aureus*, *Streptococcus viridans*, *Staphylococcus albus* and gram positive rods. Some strains of staphylococci were encountered which were highly resistant. As the work progressed it became the custom to test out the sensitivity of the infecting strain whenever possible. This procedure gives information of great value and is generally recommended, particularly in cases in which a satisfactory response has not been obtained. Details of the method used are being published elsewhere.

Early observations furthermore indicated that another important factor in determining appropriate dosage was the nature of the infection itself. Thus diffuse and phlegmonous lesions as a rule respond much more promptly than localized infections, although the activity of penicillin is not inhibited by pus or other exudates. This may be in large measure due to the actual concentration of the drug which can be attained at a given point. In any event, infections in well vascularized soft tissues respond to concentrations of drug that are apparently completely ineffective in relatively avascular hard tissues such as bone.

It should also be mentioned that little is as yet known concerning the minimal effective concentration for various types of infection. Such experimental work as has been done has been based on the assumption that effective concentrations should be constantly maintained in the circulating blood as is the custom in sulfonamide therapy. Certain facts suggest, however, that this may not always be necessary. Further work is required before any rigid schedule can be formulated, and in cases of doubt it is necessary to rely on the clinical response. In spite of these uncertainties and difficulties the following regimen is tentatively recommended as a result of the experience obtained in treating the present series of cases:

1. *Staphylococcal Infections*.—(a) Chronic osteomyelitis and chronic abscess formation, with or without bacteremia (in all such cases, sound surgical procedures should be adhered to and all foreign material, sequestrums and necrotic tissue cleanly removed by radical débridement), 20,000 units every four hours intramuscularly. Duration of treatment is dependent on the severity and extent of the process and on the clinical response.

Local treatment as indicated.

(b) Acute osteomyelitis, acute abscess formation, acute phlegmonous cellulitis and so on, 10,000-15,000 units every four hours intramuscularly. Seven days' treatment or less usually sufficient.

(c) Minor infections of the genitourinary tract (provided the infecting strain is sensitive), 10,000-15,000 units every four hours intramuscularly. If there is no clinical response in four or five days, continuation of therapy is probably not indicated.

(d) Empyema, meningitis or suppurative arthritis, 20,000 units locally daily or every two days for three or four injections. Systemic therapy as indicated by the nature of the primary infection.

2. *Pneumococcal Infections*.—(a) Pneumococcal pneumonia, 10,000 units every four hours intramuscularly. Ten injections frequently are sufficient, but continuation of therapy for two or three days may be necessary.

(b) Empyema, 20,000 units intrapleurally in 30 or 40 cc. of saline solution every two days for three or four injections. Systemic therapy as indicated.

(c) Meningitis, 20,000 units intrathecally daily. Two or three injections usually are sufficient. Systemic therapy as indicated.

3. *Streptococcal Infections*.—(a) Infections due to hemolytic streptococci (group A Lancefield), 10,000 units every four hours intramuscularly. Treatment for four or five days is usually adequate except in chronic infections, with or without bone involvement, when prolonged treatment may be necessary.

(b) Infections due to hemolytic streptococci other than group A and to *Streptococcus viridans* (information at present available is insufficient but strains of hemolytic streptococci belonging to groups B, C, D, E, F and G [Lancefield] have been found to be sensitive in vitro; some strains belonging to group D are resistant; strains of nonhemolytic streptococci are, as a rule, from two to four times more resistant than strains of group A hemolytic streptococci), 20,000 units every four hours intramuscularly. Duration of therapy is dependent on clinical response.

4. *Infections Due to Meningococci and Gonococci*.—(a) Blood stream infections and acute infections of the genitourinary tract, 10,000-15,000 units every four hours intramuscularly. Two days' therapy is usually adequate. In cases of bacteremia, treatment should be continued for two days after the temperature has returned to normal.

(b) Meningitis, 20,000 units intrathecally daily. Two or three injections are usually sufficient. Systemic treatment as indicated.

(c) Acute arthritis, 10,000 units intra-articularly daily. Two or three injections are usually sufficient. Systemic therapy if intra-articular therapy is not possible.

5. *Mixed Infections*.—These are usually difficult to treat and relatively resistant. Dosage depends on a variety of factors: 20,000 units every four hours intramuscularly until a clinical response is obtained.

6. *Other Infections*.—Data available are insufficient.

7. *Topical Applications*.—Irrigation of sinus tracts or application of wet dressings daily with solution of penicillin containing 100 units per cubic centimeter are usually satisfactory.

Attention is called to three points in these tentative recommendations: 1. The initial dose recommended is the same as subsequent doses; there seems no valid reason for administering a large initial dose. 2. Higher doses are not recommended in the presence of bacteremia than in cases without bacteremia. In point of fact, the actual sterilization of the blood stream itself is in most instances a comparatively simple matter. 3. Except in general sepsis and for local therapy the intramuscular route is recommended for all injections. It will be apparent from the details of the cases subsequently reported that in many instances the dosage employed was smaller than that recommended in the foregoing schedule, which in itself is somewhat more conservative than that advocated in the recent report of the Committee on Chemotherapeutic and Other Agents.⁴ Although the results were satisfactory in the majority of cases, the smaller doses were used in order to conserve the limited supply of penicillin. Probably a more prompt response would have been obtained in certain instances by the use of larger amounts of material. Further experience is required to determine the minimal effective dosage until such time as adequate supplies become generally available.

TABLE 1.—Cases Treated Systemically

I. Staphylococcal Infections:	
(a) With bacteremia	18
(b) Without bacteremia	19
	— 37
II. Pneumococcal Infections:	
(a) Pneumonia	10
(b) Meningitis	4
(c) Acute endocarditis	3
(d) Empyema	2
	— 19
III. Streptococcal Infections:	
(a) Due to hemolytic streptococci	2
(b) Due to nonhemolytic streptococci (other than subacute bacterial endocarditis)	2
(c) Subacute bacterial endocarditis	10
	— 14
IV. Meningococcal and gonococcal Infections:	
(a) Meningococcal	2
(b) Gonococcal	8
	— 10
V. Mixed Infections	11
VI. Infections of questionable causation	6
	— 100

METHOD OF ADMINISTRATION

Since the intramuscular route appears to be the route of choice except in certain types of infection, and since frequent administration is essential, it is desirable that the drug should be given in as small a volume as possible. The sodium salt is readily soluble in isotonic solution of sodium chloride and can be conveniently administered in amounts of 5,000 units per cubic centimeter. If larger doses are required, the concentration may be increased to 10,000 units per cubic centimeter.

In topical application the Committee on Chemotherapy has recommended solutions containing 250 or 500 units per cubic centimeter. From experimental observations and from our own clinical experience, solutions containing 100 units per cubic centimeter appear to be adequate in the majority of cases. However, no untoward effects have been observed from the use of concentrations far greater than those mentioned, and very possibly better results will be obtained by using stronger solutions.

PENICILLIN RESISTANT STRAINS

As previously mentioned, strains of staphylococci have been encountered which exhibit a high degree of resistance to penicillin. These have invariably been

poor pigment producing strains of low virulence. So far, resistant strains of hemolytic streptococci (group A), pneumococci, gonococci or meningococci have not been encountered.

The acquisition of resistance to penicillin by virulent strains of various organisms, especially staphylococci, under both clinical and experimental conditions has been reported by several observers.¹⁰ This is obviously a phenomenon of importance in prolonged therapy and has been advanced as an argument against the use of small dosage of the drug early in treatment. However, its significance seems to be greatly minimized by the further observation that in such instances there was a corresponding loss of virulence of the organism.¹¹ Furthermore, the acquisition of resistance to the drug must be a relatively rare event, since it was encountered in only 1 possible instance in the present series of cases, many of which were under treatment for prolonged periods.

GENERAL ANALYSIS OF CASES TREATED

Classified according to the nature of the infecting organism, the cases that have been treated systemically are summarized in table 1. No report is made at this time on cases treated topically.

CLINICAL RESULTS

1. Staphylococcal Infections.—The staphylococcal infections are divided into two groups, 18 cases with bacteremia and 19 cases without bacteremia, a total of 37 patients (tables 2 and 3).

(a) With Bacteremia (18 cases): The ages of the patients with bacteremia varied from 9 days to 74 years; 9 were over 40 years of age. The cases represented a wide variety of conditions, including 5 cases of proved acute osteomyelitis, and infection had persisted for variable periods of time before therapy was instituted. In 2 cases penicillin therapy was used in conjunction with surgical incision and drainage. In 15 of the 18 cases a satisfactory response was obtained; 3 cases relapsed but responded to subsequent therapy, 3 cases terminated fatally and 1 case ended fatally because of a recurrence after an initial response. The 3 cases in which the outcome was fatal deserve special mention: 1. A 9 day infant with pyemia was inadequately treated for four days after the infection had assumed overwhelming proportions. (It will be observed, however, that a completely satisfactory result was obtained in another 18 day old infant with a more or less comparable type of infection which was much more intensively treated.) 2. In a case of epidural abscess and complete paraplegia the local and systemic infection was controlled but death occurred from complications associated with the paraplegia. 3. A patient with acute endocarditis and overwhelming sepsis was treated in the terminal stages of his illness. In the case in which death occurred after an initial response, multiple lung abscesses and bacteremia occurred in a two and a half month infant with cystic fibrosis of the pancreas. The blood stream infection was promptly controlled and the lung lesions gradually healed. Several weeks later, however, the pulmonary infection recurred and, because of difficulties inherent in the nature of the case, further treatment was not instituted. In summary, therefore,

10. McKee, C. M., and Houck, C. L.: Induced Resistance to Penicillin of Cultures of Staphylococci, Pneumococci and Streptococci, *Proc. Soc. Exper. Biol. & Med.* 53: 33 (May) 1943. Schmidt, L. H., and Sesler, C. L.: Development of Resistance to Penicillin by Pneumococci, *ibid.* 52: 353 (April) 1943.
11. McKee, C. M., and Houck, C. L.: Induced Penicillin Resistance in a *Pneumococcus* Type III Culture, *Federation Proceedings* 2: 100 (March 16) 1943.

satisfactory results were obtained in all cases of staphylococcal bacteremia which could reasonably have been expected to respond. It is realized, of course, that a further follow-up period is required in many instances to determine the ultimate outcome.

Dosage.—The dosage employed in this group of cases varied from 5,000 units every four hours to 25,000 units every three hours. The total amount of penicillin given ranged from 180,000 units (excluding the infant which received only 20,000 units) to 2,250,000 units, and treatment lasted from five to thirty-two days. The wide variations in amounts of drugs administered were in part due to inexperience in the early stages and in part due to the meager supply of penicillin available at different times while the study was under way. Gradually with the accumulation of experience and with a

infections in well vascularized, soft tissues respond more promptly and require a smaller amount of drug than do more chronic infections, especially those in relatively avascular tissue, such as bone. In the former group 10,000 units every four hours would seem to constitute an adequate dose in most instances, while the latter require 20,000 to 25,000 units every four hours. The length of time for which treatment should be continued will vary according to the individual case, but a period of two days after the temperature has become normal would seem to be sufficient in most instances.

Four cases in this group which are of particular interest are briefly summarized:

1. A man aged 49 underwent a reconstruction operation for a probable pathologic fracture of the neck of the femur. The course was uneventful until ten days after operation, when

TABLE 2.—*Staphylococcal Infections With Bacteremia*

No.	Clinical Diagnosis	Age	Penicillin		Result	Comment
			How Treated, Units	Total Dosage, Treated Units		
1	Osteomyelitis.....	74	10,000 q. 3 h. I. M.	30 2,250,000	Satisfactory	Patient with destruction of L4 and L5; infection recurred twice when therapy was interrupted; final outcome completely satisfactory
2	Osteomyelitis.....	12	5,000 q. 3 h. I. M.	5 190,000	Satisfactory	Dramatic response in an early acute case
3	Osteomyelitis.....	15	5,000 q. 3 h. I. M.	16 640,000	Satisfactory	Infection recurred twice; finally cured
4	Osteomyelitis.....	12	10-20,000 q. 4 h. I. M.	23 1,880,000	Satisfactory	Local infection recurred once when treatment was interrupted
5	Osteomyelitis, suppurative arthritis	12	10,000 q. 3 h. I. V. and I. M., 25,000 intra-articularly in one occasion	19 1,690,000	Satisfactory	Bacteremia and suppurative arthritis controlled; local infection persisted
6	Furuncle.....	14	5,000 q. 3 h. I. V.	5 180,000	Satisfactory	Blood culture became negative within 24 hours
7	Carbuncle, lung abscesses, pleural effusion	33	25,000 q. 3 h. I. M.	9 1,800,000	Satisfactory	A remarkable recovery in a desperately ill patient; carbuncle drained surgically
8	Perinephric abscess.....	28	5,000 q. 3 h. I. M.	11 440,000	Satisfactory	Acute infection following surgical drainage; response dramatic
9	Multiple lung abscesses.....	2½ mo.	2,500 q. 3 h. I. M.	32 602,000	Satisfactory	Infant with cystic fibrosis of pancreas; infection later recurred and patient succumbed
10	Epidural abscess, paraplegia.....	58	5,000 q. 3 h. I. M.	14 515,000	Died	Systemic and local infection controlled; death due to complications associated with paraplegia
11	Infected surgical wound.....	49	5,000 q. 3 h. I. V.	6 260,000	Satisfactory	Sulfonamides ineffective
12	Stomatitis, bronchopneumonia, and other conditions	18 days	2,500-5,000 q. 3 h. I. M.	16 495,000	Satisfactory	Sulfonamides ineffective
13	Traumatic urethritis, thrombophlebitis	58	5,000 q. 4 h. I. M.	18 575,000	Satisfactory	Sulfonamides ineffective
14	Pyemia.....	9 days	500 q. 3 h. I. M.	5 20,000	Died	Infant inadequately treated in terminal stages
15	Bacteremia of unknown origin....	56	10,000 q. 3 h. I. M.	10 840,000	Satisfactory	Three positive blood cultures before treatment started; primary infection undetermined
16	Bacteremia of unknown origin, empyema	40	20,000 q. 4 h. I. M.	5 600,000	Satisfactory	Gratifying response in an acutely ill patient; systemic treatment only
17	Acute endocarditis, miliary abscesses and other conditions	73	20,000 q. 4 h. I. M. 1 day; 10,000 q. h. I. V. 2 days	3 480,000	Died	Overwhelming sepsis in a decompensated cardiac with diabetic gangrene
18	Suppurative bursitis.....	63	20,000 q. 4 h. I. M., local treatment for 10 days	7 600,000	Satisfactory	Severe infection involving entire upper arm treated in combination with surgery

more constant supply of material it became possible to work out a more rational schedule. Further experience is still required, however, before any rigid rules can be laid down, and different clinical conditions almost certainly require different amounts of drug. Examples of probably inadequate treatment are cases 1 and 3. In case 3, in which only 5,000 units was administered every three hours, the infection recurred twice and it was necessary to continue treatment for a total of sixteen days. Case 1, in which 10,000 units was administered every three hours, similarly regressed twice and was treated for a total of thirty days. Very possibly the infection could have been controlled in a shorter period of time had therapy been adequate. On the other hand, the infection in case 6, of desperate illness, in which 25,000 units was administered every three hours for nine days, might very possibly have responded to a smaller amount of drug. Probably the minimal adequate dosage lies somewhere between these two extremes.

From this limited series it is possible to draw the tentative conclusion that acute systemic infections and

the temperature began to rise. On the twelfth day the patient had a chill with a leukocytosis of 16,000. Inspection of the wound on the fourteenth day showed the presence of purulent material. Blood culture was positive for hemolytic *Staphylococcus aureus*. Local drainage was instituted and the patient started on sulfadiazine. The wound was opened widely and all sutures were removed. Despite maximal dosage of sulfadiazine and a combination of zinc peroxide and sulfadiazine locally, the patient continued to have elevated temperature with chills for the next four days and the blood culture remained positive. At this time intravenous penicillin 5,000 units every three hours intravenously was started. Forty-eight hours later the blood culture became negative and the temperature came down steadily, returning to normal six days after the beginning of penicillin therapy. Subsequent convalescence was uneventful.

2. A baby aged 18 days, who was said to have had thrush and a postnasal catarrh on discharge from a maternity hospital, was in acute distress on admission, cyanotic, with gasping respirations, and the mouth and nose were full of mucous secretion. A hemorrhagic membrane was present on the posterior pharynx. Nose and throat cultures were positive for hemolytic *Staphylococcus aureus* without monilias. Blood cultures were also positive for hemolytic *Staphylococcus aureus*. X-ray exami-

nations revealed diffuse lobular pneumonia. The infant was placed in an oxygen tent and put on atropine and 1 per cent ephedrine nose drops. A 5 per cent solution of sodium sulfadiazine was given subcutaneously. On the sixth hospital day there was no significant improvement in spite of a sulfadiazine blood level of 13 mg. per hundred cubic centimeters. Penicillin was started, 5,000 units every three hours intramuscularly. Within twenty-four hours the baby began to show definite improvement and in succeeding days progress was rapid. The blood culture promptly became negative, the membrane of the mouth entirely disappeared and x-ray examinations during the third week revealed complete clearing of the lobular pneumonia.

3. A boy aged 12 years who had osteomyelitis with hemolytic *Staphylococcus aureus* septicemia was admitted with chills and

portion of the scrotum was swollen, with pus escaping from several sinus tracts. The patient was started on sulfathiazole 6 Gm. a day for two days, then sulfadiazine 6 Gm. a day for two days without response. Blood cultures were positive for hemolytic *Staphylococcus aureus*, and the clinical condition continued poor. Pleural effusion developed on the left and acute axillary pain on the right with an accompanying friction rub. X-ray examinations of the lungs revealed several areas suggesting early abscess formation. Penicillin therapy was instituted, 25,000 units every three hours intramuscularly. The temperature fell somewhat but remained at levels around 102 F. for five days. A thoracentesis was performed on the third day of penicillin therapy and thin purulent material obtained which grew hemolytic *Staphylococcus aureus*. The scrotal abscess was incised on the fourth day of penicillin therapy.

TABLE 3.—*Staphylococcal Infections Without Bacteremia*

No.	Clinical Diagnosis	Age	Penicillin		Result	Comment
			How Treated, Units	Days Treated, Total Dosage, Units		
1	Meningitis.....	14	5,000 q. 3 h. I. M.	12 500,000	Satisfactory	Meningitis following removal of brain tumor; patient subsequently died with ventricular block; no infection at autopsy
2	Suppurative parotitis.....	22	5,000 q. 3 h. I. M.	12 490,000	Satisfactory	Critically ill patient with profound anemia, jaundice, hematuria and nitrogen retention following sulfonamide therapy
3	Infected renal cyst.....	39	5,000 q. 3 h. I. M.	6 280,000	Satisfactory	Patient desperately ill; infected multilocular cyst of kidney ruptured when removed surgically; postoperative course satisfactory
4	Empyema.....	57	10,000 q. 3 h. I. M., 25,000 q. d. intra- pleurally for 4 days	4 305,000	Satisfactory	Gratifying response without thoracotomy
5	Chronic osteomyelitis and suppurative arthritis	56	10,000 q. 3 h. I. M., 10,000 q. d. intra-articularly for 2 days	18 1,400,000	Unsatisfactory	Complicated case in which adequate surgery was not possible; infection temporarily controlled; therapy inadequate for a relatively resistant organism
6	Chronic osteomyelitis.....	22	10,000 q. 4 h. I. M.	8 400,000	Satisfactory	Adequate surgery
7	Chronic osteomyelitis.....	23	5,000 q. 3 h. I. M., 10,000 q. d. locally for 12 days	7 300,000	Unsatisfactory	Initial response satisfactory; further treatment with adequate surgery indicated
8	Suppurative arthritis.....	33	10,000 q. 3 h. I. M., 40,000 q. d. intra-articularly for 5 days	8 830,000	Satisfactory	Dramatic response
9	Furunculosis.....	69	5,000 q. 3 h. I. M.	3 125,000	Satisfactory	Recurring furunculosis of face and neck; prompt response
10	Furuncle.....	59	5,000 q. 3 h. I. M.	6 235,000	Satisfactory	Furuncle of nose; gradual response
11	Carbuncle.....	32	5,000 q. 3 h. I. M.	4 175,000	Satisfactory	Gradual response
12	Deep abscess, secondary to chronic osteomyelitis	52	5,000 q. 3 h. I. M., 2,000 q. 4 h. locally for 10 days	2 130,000	Satisfactory	Recurring abscess in a patient with chronic osteomyelitis; no recurrence in 12 months since treatment
13	Chronic cystitis.....	43	10,000 q. 6 h. I. M.	12 480,000	Unsatisfactory	Chronic bladder infection of 4 years' duration; etiology not clear
14	Postoperative infection.....	63	20,000 q. 4 h. I. M.	4 460,000	Satisfactory	Follow-up not obtainable
15	Postoperative infection.....	12	10,000 in 100 cc. saline q. d. locally	10 100,000	Satisfactory	Infected fascial transplant
16	Scalp infection.....	42	20,000 q. 4 h. I. M., local treatment for 10 days	2 240,000	Satisfactory	Scalp infection, in a patient with chronic dermatitis, following removal of brain tumor
17	Osteomyelitis.....	38	10-20,000 q. 4 h. I. M.	11 1,080,000	Satisfactory	Chronic osteomyelitis of 34 years' duration treated in combination with adequate surgery
18	Chronic pyelitis with recurring renal calculi	44	10,000 q. 4 h. I. M.	9 500,000	Unsatisfactory	Organism resistant in vitro
19	Wound infection.....	50	20,000 q. 4 h. I. M., local treatment for 10 days	2 240,000	Satisfactory	Widespread infection following laminectomy for inoperable cord tumor

fever of four days' duration and pain in the lower end of the femur. Three blood cultures were positive for hemolytic *Staphylococcus aureus*. Both sulfadiazine and sulfathiazole were administered without apparent effect. Penicillin therapy was instituted, 5,000 units every three hours intramuscularly. The temperature became essentially normal within two and a half days and no growth was obtained in blood cultures. Penicillin was discontinued after five days, and the patient made an uneventful recovery. X-ray examinations of the left femur two weeks later showed thickening of the cortex consistent with early involucrum formation of healing osteomyelitis.

4. A Negro aged 33 years was admitted to the hospital with the history of induration of the lower part of the scrotum for four days and sharp pain in the left lower anterior chest. The chest pain was aggravated by cough and deep respiration. On admission the patient was in acute distress and dyspneic, with a temperature of 104 F., a white blood cell count of 17,000 and pain in the left axillary region. There was a to and fro friction rub over the left lower chest with dullness on the right. The sputum was blood tinged. The perineal

The temperature continued to drop and reached normal levels on the tenth day, at which time penicillin was discontinued. The lesions in the lungs gradually resolved and the patient was discharged in good condition.

(b) Without Bacteremia (19 cases): The cases of staphylococcal infection without bacteremia represented an equally heterogeneous group and included 4 cases of chronic osteomyelitis. Satisfactory results were obtained in 15 of the 19 cases. Two of the unsatisfactory results occurred in cases of chronic osteomyelitis in which adequate surgery was not possible. It is of further interest that in 3 of the 4 unsuccessfully treated cases the infecting organism was subsequently found to be resistant to the action of penicillin in vitro. The first of these was a complicated case with avulsion of the foot, suppurative arthritis of the knee and osteomyelitis of the tibia and fibula. Adequate conservative surgery was not possible, and it was ultimately necessary to amputate the extremity. The other cases from which

resistant organisms were cultured were those of chronic pyelitis and chronic cystitis respectively. In the former the infection was associated with recurring renal calculi over a period of years. The urine was temporarily sterilized, but the infection recurred when treatment was discontinued. The remaining case was one of chronic cystitis of four years' duration in which there was some doubt about the precise cause.

Dosage.—The comments with regard to dosage in cases of staphylococcal infection with bacteremia appear to be equally pertinent to cases without bacteremia. In simple soft tissue infections of an acute nature, 10,000 units every four hours would seem to be adequate. In many of the cases in the present series only 5,000 units every three hours was administered. Had larger doses been employed, the period of treatment could probably have been shortened. In chronic infections, especially those involving long bones, the situation is entirely different and much larger doses are indicated, from 20,000 to 25,000 units every three or four hours. Our experience in this type of case is limited, but Major Lyons of the Halloran General Hospital reports¹² that in such infections adequate surgery, with removal of all sequestrums, dead tissue and foreign material is absolutely essential. He recommends a dosage of 20,000 to 25,000 units every three or four hours for two days prior to and for nine days subsequent to complete surgical débridement. He has further found that infections in long bones require larger doses than infections in flat bones.

Brief mention is made of 4 successfully treated cases in this group in which the results were particularly striking:

1. A youth aged 14 years had been operated on for brain tumor and was suffering from meningitis. The postoperative course was stormy, and on the eighth day spinal fluid cultures were positive for hemolytic *Staphylococcus aureus*. The same organism was recovered on two subsequent occasions. Adequate sulfonamide therapy did not influence the infection. Penicillin was administered, 5,000 units every three hours intramuscularly, and there was a gradual response. Treatment was continued for thirteen days, at the end of which time there was no clinical evidence of infection. The patient subsequently died with a ventricular block and at autopsy no evidence of residual infection was found.

2. A man aged 22 with suppurative parotitis and submaxillary cellulitis had been treated with sulfonamides for a streptococcal sore throat. Three days after the institution of sulfonamide therapy he began to vomit, became jaundiced and passed bloody urine for four days. On admission a large tense area of fluctuation presented in the region of the right parotid gland extending down the neck. The red blood cell count was 1,000,000, hemoglobin was 26 per cent and there was considerable nitrogen retention. The patient was desperately ill, and further sulfonamide therapy was obviously impossible. Surgical drainage, transfusions and penicillin 5,000 units every three hours intramuscularly were instituted. Cultures revealed hemolytic *Staphylococcus aureus*. A completely satisfactory response was obtained and, although a variety of treatments had been employed, the evidence strongly suggested that penicillin was primarily responsible for controlling the infection. In any event this case clearly demonstrates that penicillin may be safely administered when sulfonamides are contraindicated.

3. A patient with suppurative arthritis of the knee joint following arthrotomy for removal of synovia, medial meniscus and hypertrophic spurs had a normal postoperative course for seven days, when the knee began to be painful. On the ninth day the temperature spiked to 104 F. and the patient had

a shaking chill. The knee was found to be grossly infected with hemolytic *Staphylococcus aureus*. Catheters were placed in the joint, and penicillin was administered both locally and intramuscularly. The patient was given 10,000 units every three hours intramuscularly and 2,500 units locally into catheters every three hours. The improvement was pronounced within twenty-four hours, and the subsequent course was completely satisfactory.

4. A woman aged 57, admitted because of empyema, had a cough of five days' duration and left chest pain. Adequate sulfadiazine treatment produced no response and the temperature continued around 101-103 F. with a white count of 32,000. Signs of fluid appeared over the left lung, and thoracentesis revealed thick pus swarming with hemolytic *Staphylococcus aureus*. Penicillin was instilled into the pleural cavity, 25,000 units daily for four days together with intramuscular injections of 10,000 units every three hours. At the end of this period the patient was moderately improved, but the temperature continued between 100 and 102 F. and the cultures were still positive, yielding a sparse growth of *Staphylococcus aureus*. Surgical intervention was contemplated but was withheld in view of the favorable clinical response. In succeeding days the patient continued to improve. The subsequent clinical course was satisfactory without surgical treatment.

2. **Pneumococcal Infections.**—The pneumococcal infections include 19 cases representing 10 examples of pneumonia, 4 of meningitis, 3 of acute endocarditis and 1 of empyema. In addition, 2 of the pneumonia patients had an infected pleural exudate representing probably an incipient empyema.

(a) **Pneumonia:** The results in pneumococcal pneumonia were satisfactory in all instances except 1, a case of overwhelming sepsis in a parturient female. In this case both the blood stream and the pleural fluid were found to be sterile twelve hours after therapy was started, but the patient died at the end of thirty hours, apparently of toxemia and general collapse. The sterilization of this patient's blood stream and pleural cavity within twelve hours demonstrates the remarkable bactericidal property of penicillin against pneumococci. In the remaining 8 cases the response was dramatic in 4, prompt in 2 and more gradual in the other 2. In general the results were satisfactory with doses of 10,000 units every four hours for one and a half to two days, but in 1 instance there was a dramatic response with a dose of 5,000 units every three hours for one and a half days.

(b) **Meningitis:** The 4 cases of pneumococcal meningitis all responded satisfactorily. In 2 of the 4, however, it was impossible to evaluate the role of penicillin because sulfonamides and antipneumococcus serum also were administered. In the third case the infection persisted in spite of adequate sulfadiazine therapy for twelve days. Penicillin was administered intrathecally, 20,000 units daily for three days, and systemic treatment instituted as well. Within twenty-four hours the temperature returned to normal, the spinal fluid became sterile and thereafter recovery was uneventful. The fourth case was complicated by the presence of mastoiditis and petrositis, and it was necessary to continue treatment for fifteen days before a satisfactory outcome was obtained. In this case also sulfonamides had proved completely ineffective. In 3 of the 4 cases of pneumococcal meningitis, penicillin was administered intrathecally as well as systemically; in 1 case systemic treatment alone was employed. It should be pointed out, however, that in this case the inflammation of the meninges may well have permitted the penicillin to traverse the blood brain barrier, which normally is resistant to its passage.⁹

12. Lyons, Champ: *Penicillin Therapy of Surgical Infections in the U. S. Army*, J. A. M. A. 123: 1007 (Dec. 18) 1943.

The 4 cases of meningitis were treated from six to eighteen days, and the total dosage varied from 440,000 to 975,000 units.

(c) Acute Endocarditis: Reference has already been made to the 3 patients with acute pneumococcal endocarditis who were treated early in the course of the study. All received what was later recognized as totally inadequate dosage. All three succumbed to the infection, but in 2 instances the blood stream was temporarily sterilized, in 1 case on two occasions. In view of the small amounts of drug employed in such an overwhelming infection, the results at that time were considered encouraging. Since more adequate material has become available, the opportunity to treat such a case has not presented itself.

3. *Streptococcal Infections*.—(a) Due to Hemolytic Streptococci (Group A): At the present time there

the temperature returned to normal and subsequent convalescence was uneventful. At the end of one week the wound looked clean, no cellulitis was present and the area was covered with healthy granulations.

2. A woman aged 43 with a peritonsillar abscess and spreading cellulitis of the pharynx was unable to tolerate sulfonamides because of severe toxic reaction. Penicillin was administered, 10,000 units every three hours intramuscularly. There was satisfactory response and within forty-eight hours the infection had completely subsided.

(b) Due to Nonhemolytic Streptococci, not including cases of subacute bacterial endocarditis: Cases of this type of infection are only rarely encountered, and such a bacteriologic diagnosis should be made with care. Two patients were treated, both desperately ill in the terminal stages of their illness. In neither instance was the response satisfactory.

TABLE 4.—*Pneumococcal Infections*

No.	Clinical Diagnosis	Age	Penicillin			Result	Comment
			How Treated, Units	Days Treated	Total Dosage, Units		
1	Lobar pneumonia.....	40	5,000 q. 3 h. I. M.	3	115,000	Satisfactory	Recovery by lysis; type 25
2	Lobar pneumonia.....	45	10,000 q. 3 h. I. M.	1½	70,000	Satisfactory	Prompt response; type 7
3	Lobar pneumonia.....	47	10,000 q. 3 h. I. M.	2	160,000	Satisfactory	Dramatic response within 24 hours; type 7
4	Lobar pneumonia.....	43	5,000 q. 3 h. I. M.	1½	70,000	Satisfactory	Dramatic response within 12 hours; type 3
5	Lobar pneumonia.....	49	10-20,000 q. 3 h. I. M.	3	200,000	Satisfactory	Recovery by lysis; type 1
6	Lobar pneumonia.....	50	10,000 q. 3 h. I. M.	1	100,000	Died	Overwhelming sepsis in a parturient female; blood stream sterilized in 12 hours; death due to general toxemia; type 2
7	Lobar pneumonia.....	38	10-20,000 q. 4 h. I. M.	1	100,000	Satisfactory	Dramatic response in an apparently sulfonamide resistant case; type 3
8	Lobar pneumonia.....	22	10-20,000 q. 4 h. I. M.	1½	120,000	Satisfactory	Dramatic response; type 18
9	Incipient empyema following lobar pneumonia.....	47	20,000 intrapleurally	1	20,000	Questionable	Result difficult to evaluate; type 3
10	Lobar pneumonia, questionable empyema.....	67	10,000 q. 3 h. I. M., 30,000 intrapleurally	6	480,000	Satisfactory	Oliguria due to sulfonamides; cardiac; type 3
11	Bronchopneumonia.....	75	5-10,000 q. 3 h. I. M.	5	235,000	Satisfactory	Following prostatectomy; cardiac; type 8
12	Empyema.....	62	10,000 q. 3 h. I. M., 20,000 intrapleurally on five occasions	3½	375,000	Questionable	Empyema sterilized, thoracotomy to remove exudate; type 1
13	Meningitis, petrositis.....	37	10,000 q. 3 h. I. M.	15	975,000	Satisfactory	Gradual recovery; sulfonamides ineffective; mastoid drained surgically; type 3
14	Meningitis, mastoiditis.....	7 mo.	5,000 q. 3 h. I. V. or I. M., 5,000 q. d. intrathecally for 11 days	18	755,000	Recovered	Role of penicillin difficult to evaluate; also received sulfonamides and antipneumococcus serum; mastoid drained surgically; type 6
15	Meningitis, otitis media.....	5½ mo.	5,000 q. 3 h. I. M. or I. V., 1-5,000 q. d. intrathecally for 6 days	13	440,000	Recovered	Role of penicillin difficult to evaluate; also received sulfonamides and antipneumococcus serum; type 19
16	Meningitis.....	62	10,000 q. 3 h. I. M., 20,000 q. d. intrathecally for 4 days	6	440,000	Satisfactory	Dramatic response; sulfonamides ineffective; type 6
17	Acute endocarditis *.....	53	8,000 q. 3 h. I. V.	7	384,000	Died	Blood stream sterilized twice
18	Acute endocarditis *.....	48	15,000 q. 6 h. I. V.	3½	172,500	Died	Blood stream temporarily sterilized
19	Acute endocarditis, * meningitis....	40	?	3	?	Died	An early case; dosage not measured in units

* These 3 cases were among the first cases treated; in the light of subsequent experience, totally inadequate amounts of the drug were given.

appears to be little indication for the use of penicillin in hemolytic streptococcus infections because of the scarcity of the material and because of the satisfactory response of the majority of such cases to sulfonamide therapy. Cases of sulfonamide intolerance are occasionally encountered and 2 such cases came under observation:

1. A woman aged 55 had suppurative arthritis of the right ankle following compound fracture dislocation. The fibula was plated and the dislocation reduced. Sulfadiazine was given and on the third day after operation the patient developed oliguria and hematuria with a blood urea nitrogen of 76 mg. per hundred cubic centimeters. Sulfonamide therapy was discontinued but was later resumed after a return of kidney function. The first dressing on the thirteenth postoperative day showed that the wound was infected. The leg was put up in plaster, but the fever continued. Sulfonamides were again employed with gradually diminishing urinary output and no clinical improvement. After three months, amputation of the leg was considered. At this time the patient developed classic erysipelas of the face. Penicillin therapy was started, 10,000 units every three hours intramuscularly, and continued for one week. The result was dramatic. Within twenty-four hours

(c) Subacute Bacterial Endocarditis Due to Non-hemolytic Streptococci: This group of cases represents such a large and important problem that only certain aspects will be touched on in this communication; details will be published elsewhere. When penicillin was first discovered and its remarkable effect on gram positive organisms (including *Streptococcus viridans*) demonstrated in vitro, high hopes were entertained that it would be successful in combating this almost uniformly fatal type of infection. Despite the limited amount of material which has been available, the results herewith reported would appear in some measure to justify these hopes.

As previously stated, patients with this disease were selected for the preliminary clinical trials of penicillin. When larger amounts of material became available, 5 patients were treated as adequately as the still limited supply permitted. All 5 were classic examples of the disease with rheumatic hearts. In 2 of the 5 patients a satisfactory result was obtained and they are now living and well, thirteen and nine months respectively after treatment was discontinued. The third patient,

whose condition was particularly interesting, responded to penicillin on numerous occasions but invariably the infection recurred within two or three weeks after the discontinuance of treatment. This patient, however, is now in remarkably good general health and it is hoped that it will yet be possible to make a more intensive effort to terminate the infection. Of the 2 patients who were treated unsuccessfully, 1 received only 5,000 to 10,000 units every three hours for three interrupted periods of five days each; the other was intensively

sulfonamide therapy.¹³ All responded to penicillin and were cured from a clinical and bacteriologic standpoint within forty-eight hours. The dose was 10,000 or 15,000 units every three or four hours for two days.

The cases of arthritis were equally satisfactory. The first was a case of arthritis of the wrist with early destruction of the joint. Sulfonamide therapy and other measures had proved completely ineffective. The response to the administration of penicillin was unequivocal within forty-eight hours, and the final out-

TABLE 5.—*Streptococcic Infections*

No.	Clinical Diagnosis	Age	Penicillin			Result	Comment
			How Treated, Units	Days Treated	Total Dosage, Units		
			A. Due to Hemolytic Streptococci (Group A)				
1	Avulsion of foot, suppurative arthritis, erysipelas, cirrhosis of liver	55	10,000 q. 3 h. I. M.	8	650,000	Satisfactory	Oliguria and hematuria due to sulfonamides; amputation advised; response to penicillin dramatic
2	Peritonsillar abscess.....	43	10,000 q. 3 h. I. M.	4	310,000	Satisfactory	Sulfonamide sensitivity
			B. Due to Nonhemolytic Streptococci				
1	Pyemia.....	30	10,000 q. 3 h. I. M.	12	540,000	Died	Temporary improvement in a desperately ill patient treated in terminal stages
2	Meningitis, petrositis.....	6	5,000 intrathecally, 10,000 q. 3 h. I. M.	2	200,000	Died	Treated in terminal stages
			C. Subacute Bacterial Endocarditis Due to Nonhemolytic Streptococci				
1-5	Subacute bacterial endocarditis...	..	Preliminary clinical trials; dosage very small and not determined in units			.....	No significant results
6	Subacute bacterial endocarditis...	23	10-20,000 q. 3 h. I. M.	10	830,000	Recovered	Classic case; rheumatic heart; embolus to right femoral artery
7	Subacute bacterial endocarditis...	27	5-10,000 q. 3 h. I. M.	23	1,420,000	Recovered	Classic case; rheumatic heart; embolus to right femoral artery and to left eye
8	Subacute bacterial endocarditis...	40	10-40,000 q. 3 h. I. M.	30	6,670,000	Temporary improvement	Blood repeatedly sterilized; patient in excellent clinical condition after 9 months
9	Subacute bacterial endocarditis...	28	5-10,000 q. 3 h. I. M.	17	975,000	Died	Temporary improvement only
10	Subacute bacterial endocarditis...	23	10-20,000 q. 3 h. I. M.	33	7,960,000	Died	Blood temporarily sterilized; death due to cerebral embolus; blood culture positive at time of death

TABLE 6.—*Gonococcic and Meningococcic Infections*

No.	Clinical Diagnosis	Age	Penicillin			Result	Comment
			How Treated, Units	Days Treated	Total Dosage, Units		
			A. Due to Gonococci				
1	Acute arthritis of wrist.....	42	5,000 q. 3 h. I. M.	6	235,000	Satisfactory	Dramatic response in a sulfonamide resistant case
2	Acute arthritis of knee.....	41	10,000 q. d. intra-articularly	3	30,000	Satisfactory	Dramatic response with only local treatment
3	Urethritis.....	25	10,000 q. 3 h. I. M.	2	180,000	Satisfactory	Smears and cultures negative in 2 days
4	Urethritis.....	24	10-20,000 q. 4 h. I. M.	2	160,000	Satisfactory	Smears and cultures negative in 2 days
5	Urethritis.....	30	15,000 q. 4 h. I. M.	1½	150,000	Satisfactory	Smears and cultures negative in 2 days
6	Urethritis.....	24	15,000 q. 4 h. I. M.	1½	150,000	Satisfactory	Smears and cultures negative in 2 days
7	Urethritis.....	26	15,000 q. 4 h. I. M.	1½	150,000	Satisfactory	Smears and cultures negative in 2 days
8	Urethritis.....	20	15,000 q. 4 h. I. M.	1½	150,000	Satisfactory	Smears and cultures negative in 2 days
B. Due to Meningococci							
1	Meningitis.....	60	10,000 q. 3 h. I. M., 10,000 q. d. intrathecally for 2 days	3	240,000	Satisfactory	Anuria from sulfonamides
2	Meningitis.....	17 mo.	2,500-5,000 q. 3 h. I. M.	3	77,500	Unsatisfactory	Penicillin not given intrathecally; patient subsequently responded to sulfonamides and antimeningococcus serum

treated but succumbed to a cerebral embolus. At the time of death the blood culture was still positive. Much remains to be learned concerning the most effective method of administering penicillin in cases of subacute bacterial endocarditis, but these preliminary results appear sufficiently encouraging to justify an intensive study of the therapy of this disease as soon as adequate material becomes available.

4. *Gonococcic and Meningococcic Infections.*—(a) *Infections Due to Gonococci:* The number of cases of gonococcic infection treated is limited, but the results have been most instructive and satisfactory. Eight cases in all are reported, 6 of urethritis and 2 of arthritis. The 6 cases of urethritis were completely resistant to

come was a normally functioning joint. The second case of arthritis was treated locally by the injection of 10,000 units daily for three days into the knee joint. The result was dramatic and the patient was discharged on the fifth day, all evidence of infection having subsided.

(b) *Infections Due to Meningococci:* Experience with meningococcic infections has also been very limited and includes only 2 cases. A satisfactory response was obtained in a patient who had developed anuria from sulfonamide therapy. This patient received 10,000

13. Herrell, W. E.; Cook, E. N., and Thompson, Luther: Use of Penicillin in Sulfonamide Resistant Gonorrheal Infections, *J. A. M. A.* 122: 289 (May 29) 1943.

units intrathecally on two successive days and 10,000 units every three hours intramuscularly. There seemed to be no doubt that penicillin was responsible for controlling the infection. An unsatisfactory response was obtained in an infant aged 17 months who received only systemic treatment by intramuscular injections. The apparent failure of penicillin in this case lends further support to the finding that this agent does not normally pass through the blood brain barrier. The infection subsequently responded to antimeningococcus serum and sulfonamide therapy.

Four cases which responded satisfactorily in this group are briefly summarized:

1. An infant aged 3 months was acutely ill with laryngo-tracheitis. A tracheotomy was performed and cultures were positive for hemolytic streptococci, hemolytic Staphylococcus aureus and Streptococcus viridans. Penicillin was administered systemically, 600 units every three hours, and 1 cc. of a solution of penicillin containing 250 units per cubic centimeter was instilled into the tracheotomy tube every three hours. The following day the child seemed better and on the fourth day the temperature was normal. Thereafter recovery was uneventful.

TABLE 7.—Mixed Infections

No.	Clinical Diagnosis	Age	Penicillin			Result	Comment
			How Treated, Units	Days Treated	Total Dosage, Units		
1	Lung abscess.....	8 mo.	2,000 q. 3 h. I. M.	15	210,000	Satisfactory	Infant with cystic fibrosis of pancreas; blood culture positive for both hemolytic streptococcus and Staphylococcus aureus; remarkable response but infection recurred and infant died
2	Laryngotracheitis.....	3 mo.	600 q. 3 h. I. M., 250 q. 3 h. into tracheotomy tube	10	70,000	Satisfactory	Staphylococcus and streptococcus; tracheotomy ineffective
3	Ludwig's angina.....	60	5,000 q. 3 h. I. M.	7	295,000	Satisfactory	Staphylococcus and streptococcus; aplastic anemia; remarkable response
4	Acute tracheitis, pyemia.....	31	5-10,030 q. 3 h. I. M.	5	250,000	Died	Staphylococcus and streptococcus; treated in terminal stages
5	Bronchiectasis.....	56	10,000 q. 3 h. I. M.	3½	250,000	Unsatisfactory	No effect in a chronic case
6	Empyema.....	62	25,000 q. d. intrapleurally	3	75,000	Died	Putrid empyema; temporarily sterilized
7	Chronic cystitis.....	62	5,000 q. 6 h. I. M.	6	120,000	Unsatisfactory	Temporary improvement; mixed bacterial flora; anaerobic hemolytic streptococcus predominant
8	Necrotizing ulcer.....	58	5,000 q. 3 h. I. M., local penicillin dressings	3	120,000	Unsatisfactory	Staphylococcus and streptococcus; organisms resistant in vitro
9	Infected comminuted fracture.....	16	5,000 q. 3 h. locally by catheter	5	132,000	Satisfactory	Hemolytic Staph. aureus and Neisseriae
10	Lung abscess, metastatic brain abscess	46	10-15,000 q. 3 h. I. M. and I. V.; 20,000 intrapleurally on 8 occasions	50	4,050,000	Satisfactory	Lung abscess cleared; patient ultimately succumbed to brain abscess
11	Osteomyelitis, multiple sinuses, fecal fistula, etc.	57	10,000 q. 3 h. I. M.	8	620,000	Died	A very complicated case
12	Subphrenic abscess, empyema, suppurative pericarditis	29	10,000 q. 3 h. I. M., 50,000 intrapericardially	3	270,000	Died	A very complicated case
13	Cellulitis and multiple abscesses...	41	25,000 q. 4 h. I. M., local penicillin dressings q. d. for 8 days	3	560,000	Satisfactory	Definite improvement in general and local condition
14	Necrotizing pharyngitis.....	7½	10,000 q. 4 h. I. M.	7	420,000	Satisfactory	Necrotizing pharyngitis in a patient with leukemia

TABLE 8.—Infections of Uncertain Etiology

No.	Clinical Diagnosis	Age	Penicillin			Result	Comment
			How Treated, Units	Days Treated	Total Dosage, Units		
1	Atypical pneumonia.....	56	10,000 q. 3 h. I. M.	4	300,000	Unsatisfactory	No response
2	Atypical pneumonia.....	21	20,000 q. 3 h. I. M.	3	480,000	Unsatisfactory	No response
3	Atypical pneumonia.....	48	10-20,000 q. 4 h. I. M.	3	270,000	Unsatisfactory	Questionable response
4	Bronchopneumonia.....	51	10-20,000 q. 4 h. I. M.	3	270,000	Died	Autopsy not obtained; postmortem cultures of blood, pleural exudate and aspirated lung all negative
5	Bronchopneumonia.....	4½	10,000 q. 4 h. I. M.	2	100,000	Satisfactory	Etiology obscure
6	Recurring parotitis (von Mikulicz's syndrome)	50	10,000 q. 3 h. I. M.	4	230,000	Unsatisfactory	No response

5. Mixed Infections (14 cases).—These cases represent a mixed group both bacteriologically and clinically and are difficult to discuss collectively. The majority were due to mixed infections of staphylococci and streptococci, but in several instances there was a multiplicity of other organisms including gram negative rods. As might have been expected, the results were the least satisfactory of the entire series. Eight of the 14 terminated fatally or gave unsatisfactory results. Almost certainly therapy was inadequate in several instances but, on the other hand, in many cases it seemed doubtful that any type of therapy could have been successful.

2. A patient with aplastic anemia had fulminating Ludwig's angina due to hemolytic streptococci and hemolytic Staphylococcus aureus. The blood count showed only 800,000 red and 400 white cells and no kidney output. Three days of sulfadiazine therapy were without effect. Surgical intervention and tracheotomy were considered too hazardous. Penicillin was administered, 5,000 units every three hours intramuscularly. Within twenty-four hours the condition was definitely improved and within six days the neck had returned essentially to normal. However, the patient continued to pursue a downhill course, presumably because of cerebral bleeding associated with the aplastic anemia. At autopsy a few days later no gross evidence of infection was found in the tissues of the neck.

3. A man aged 36 with a comminuted compound fracture of the lower leg of ten days' duration was given sulfadiazine for four days without effect. Cultures yielded hemolytic *Staphylococcus aureus* and neisserian organisms. The patient was treated with penicillin locally, the solution being introduced through three catheters. The temperature dropped from levels of 101 and 102 to 99 and 100 F., and the wound became much cleaner. Penicillin was continued for six days, at the end of which time the temperature became normal and the wound continued to remain clean.

4. An infant aged 8 months had a lung abscess with cystic fibrosis of the pancreas. Blood cultures were positive for both hemolytic streptococcus and hemolytic *Staphylococcus aureus*. Penicillin 2,000 units was administered every three hours intramuscularly for fifteen days. The systemic infection was satisfactorily controlled and the lung lesion gradually disappeared. (Follow-up on this patient two months later showed a recurrence of the pulmonary infection and, in view of the uniformly fatal nature of this disease, further therapy was not employed.)

Only a few brief comments need to be made concerning the unsuccessful outcome in the remaining 8 cases of mixed infection. It has been clearly demonstrated experimentally that penicillin is not effective against gram negative bacilli. Furthermore, the English workers have shown¹⁴ that certain gram negative rods including *Escherichia coli* actually secrete an enzyme, penicillinase, which destroys penicillin. It is therefore to be expected that the results would be unsatisfactory in cases of mixed infection when organisms of this type are present.

TOXICITY AND REACTIONS

A variety of experimental observations have indicated that penicillin is completely devoid of toxic effects in concentrations far beyond those necessary for therapeutic purposes. These observations have been fully borne out during the clinical trials. It should also be pointed out that the preparations of penicillin at present available are far from pure, the actual amount of pure penicillin being less than one fifth of the injected material. It is therefore possible that such reactions as may be observed may be due to impurities in the preparations or to associated factors attendant on the administration of the drug.

In the present series almost no complications or toxic effects have been observed. Three patients developed a mild urticaria. Chills and fever have not been observed since the early cases when the material was known to contain a pyrogenic substance. Thrombophlebitis, which has been reported by others,⁴ has been observed in only 1 instance. This may be due to the fact that in our cases the intravenous route was employed only occasionally. Some patients complained of slight discomfort at the site of the intramuscular injections, but this type of reaction seemed to be connected with particular lots of material. In the great majority of cases no symptoms of any nature were observed.

Prolonged administration has not led to the development of any intolerance or sensitivity. One patient who had been treated intermittently with large doses for more than six months experienced no delayed or cumulative effect of any type. The noteworthy fact has already been commented on that in this case the infecting strain showed no evidence of becoming resistant to the action of penicillin.

SUMMARY AND CONCLUSION

The present clinical study based on 100 cases demonstrates that penicillin is a remarkably effective agent in

the treatment of infections due to staphylococci, pneumococci, streptococci, gonococci and meningococci.

The efficacy of penicillin in staphylococcal infections is of importance not because of a special sensitivity of staphylococci but because of the refractoriness of this type of infection to sulfonamide therapy.

A favorable response has been obtained in 15 out of 18 cases of staphylococcal bacteremia; in many instances the effect was dramatic. The 3 cases which terminated fatally all represented problems of great complexity.

The results in 19 cases of staphylococcal infection without bacteremia have been equally impressive. In 3 out of the 4 cases which failed to respond, the infecting organism was subsequently found to be resistant to penicillin in vitro. In chronic osteomyelitis the results have been satisfactory only when penicillin therapy was used in conjunction with adequate surgery. One case of frank empyema and 2 cases with heavily infected pleural exudate have been successfully treated without thoracotomy.

Penicillin has proved highly effective in the treatment of pneumococcal, hemolytic streptococcus, gonococcal

TABLE 9.—Summary of Results

Type of Infection	No. of Cases	Satisfactory	Questionable	Unsatisfactory
Staphylococcal				
(a) With bacteremia.....	18	15	..	3*
(b) Without bacteremia.....	19	16	..	3*
Pneumococcal				
(a)	10	8	1	1*
(b)	4	2	2	..
(c)	3	..	..	3*
(d)	2	..	2	..
Streptococcal				
(a) Due to hemolytic streptococci.....	2	2	..	..
(b) Due to nonhemolytic streptococci (other than subacute bacterial endocarditis).....	2	..	..	2
(c) Subacute bacterial endocarditis.....	10	2	1	7*
Meningococcal and gonococcal				
(a) Meningococcal.....	2	1	..	1*
(b) Gonococcal.....	8	8	..	..
Mixed etiology.....	14	7	..	7
Questionable etiology.....	6	1	..	5
	100	62	6	32

* See text.

and meningococcal infections. In this group 28 cases which failed to respond to sulfonamide therapy or in which sulfonamides were contraindicated have been treated.

In 9 out of 10 cases of lobar pneumonia, 2 of which showed signs of incipient empyema, the results were uniformly good. The only failure occurred in an overwhelming infection in a parturient female. In this case the blood stream was sterilized within twelve hours, and death apparently resulted from general toxemia. One case of pneumococcal meningitis, which persisted in spite of intensive sulfonamide therapy, yielded promptly to the intrathecal administration of penicillin. The blood stream was temporarily sterilized in 2 cases of acute pneumococcal endocarditis treated with inadequate amounts of material early in the course of the study.

In sulfonamide resistant gonococcal infections, including gonococcal arthritis, the results have been particularly striking.

The response in 1 case of meningococcal meningitis in which penicillin was not administered intrathecally was unsatisfactory.

The results in the treatment of early cases of subacute bacterial endocarditis due to nonhemolytic streptococci have been encouraging.

14. Abraham, E. P., and Chain, E.: An Enzyme from Bacteria Able to Destroy Penicillin, *Nature* 146: 837 (Dec. 28) 1940.

In infections of mixed etiology the results have been less uniformly satisfactory. A favorable response has been obtained only in those cases in which gram positive organisms played a dominant role. Penicillin is not effective against gram negative bacilli.

Penicillin has proved ineffective in the treatment of 3 cases of primary atypical pneumonia.

The data at present available indicate that the most practical method of administering penicillin is by intramuscular injection at intervals of four hours. In the presence of severe sepsis intravenous administration may be necessary. Intrapleural and intra-articular administration have been employed with excellent results in cases of empyema and suppurative arthritis. In cases of meningitis, penicillin should be administered intrathecally.

Toxic reactions of a mild nature have been encountered only in occasional instances. Urticaria was observed in 3 cases and phlebothrombosis in 1. These reactions were probably due to impurities in certain preparations and not to penicillin itself.

THE CLINICAL USE OF PENICILLIN

AN ANTIBACTERIAL AGENT OF BIOLOGIC ORIGIN

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At this stage of development of penicillin therapy it is a matter of extreme delicacy to formulate statements which may be considered final with regard to the clinical use of penicillin. It is further true that the treatment of infections with penicillin is accompanied by many problems not as a rule encountered in the use of therapeutic agents heretofore available.

It is well to recall that Fleming¹ in 1929 found that the broth in which *Penicillium notatum* had grown was inhibitory for certain pathogenic organisms. He named the substance penicillin. Unfortunately, penicillin did not receive clinical application for a period of eleven years following his observations. Penicillin, however, was used in the laboratory during this time for the purpose of isolating unsusceptible organisms. It is proper to award to Fleming the prize of priority for the first attempt to use penicillin in human subjects. He used broth filtrates to irrigate large infected surfaces of man and also irrigated the human conjunctiva every four hours with this material. He reported only that no toxic effects were observed and did not report clinical results.

Following the isolation of an antibacterial agent, gramicidin, from *Bacillus brevis* by Dubos² in 1939, a reinvestigation of substances of biologic origin was naturally undertaken. Chain and other Oxford investigators³ in 1940 reported on penicillin and its possibilities as a chemotherapeutic agent. One of the first reports on penicillin in America was that by Dawson

and his associates⁴ at the meeting of the American Society for Clinical Investigation in May 1941. In addition to studies on the antibacterial activity of penicillin, Dawson and his associates mentioned briefly its use in human infections. This report stimulated many investigators to attempt the preparation of penicillin and to study it further. In August 1941 the Oxford investigators⁵ further reported on a fairly purified product of penicillin and included in this report the first clinical results. The experimental observations made at the Mayo Clinic on the antibacterial activity of penicillin were presented before the Society of American Bacteriologists in December 1941. Subsequent to this Heilman and I⁶ were able to prepare and to obtain small quantities of penicillin for our investigations. In 1942 Heilman, Williams and I⁷ reported observations on the clinical effectiveness of penicillin which were in agreement with the results published by the Oxford investigators. The report on penicillin in the treatment of infections published by Keefer and his associates⁸ in August 1943 further confirmed the results published by the earlier investigators on the clinical use of this substance.

Penicillin has been used at the Mayo Clinic in the treatment of 62 patients suffering with bacterial infections.⁹ A few of the cases have been reported previously; however, our clinical experience to date will be summarized in the present report.

PREPARATIONS OF PENICILLIN SUITABLE FOR CLINICAL USE

Sodium Salt of Penicillin.—Practically all of the experimental and clinical reports which have appeared previously in connection with the work on penicillin have had to do with studies in which the sodium salt of penicillin was used. The sodium salt of penicillin which my associates and I have used in our experimental and clinical studies was that prepared by the Abbott Laboratories. The sodium salt of penicillin is hygroscopic; it is destroyed easily by alterations of the hydrogen ion concentration in the surrounding medium and is sensitive to oxidizing agents. Heat, primary alcohols and metals alter the material. Because of these and other properties, the penicillin must be stored in the ice box at temperatures no higher than 5 C. This material is dispensed usually in sealed ampules and in as nearly the dry state as possible. The sodium salt of penicillin was used in 50 of the 62 cases on which this paper is based.

Calcium Salt of Penicillin.—The Oxford investigators in 1942 and again in 1943¹⁰ reported their observations on the calcium salt of penicillin. They found

4. Dawson, M. H.; Hobby, Gladys L.; Meyer, Karl, and Chaffee, Eleanor: Penicillin as a Chemotherapeutic Agent, *J. Clin. Investigation* 20: 434 (July) 1941.

5. Abraham, E. P.; Chain, E.; Fletcher, C. M.; Gardner, A. D.; Heatley, N. G.; Jennings, M. A., and Florey, H. W.: Further Observations on Penicillin, *Lancet* 2: 177-188 (Aug. 16) 1941.

6. Heilman, Dorothy H., and Herrell, W. E.: Comparative Antibacterial Activity of Penicillin and Gramicidin: Tissue Culture Studies, *Proc. Staff Meet., Mayo Clin.* 17: 321-327 (May 27) 1942; Comparative Bacteriostatic Activity of Penicillin and Gramicidin, *abstr., J. Bact.* 43: 12-13 (Jan.) 1942.

7. Herrell, W. E.; Heilman, Dorothy H., and Williams, H. L.: Clinical Use of Penicillin, *Proc. Staff Meet., Mayo Clin.* 17: 609-616 (Dec. 30) 1942.

8. Keefer, C. S.; Blake, F. G.; Marshall, E. K., Jr.; Lockwood, J. S., and Wood, W. B., Jr.: Penicillin in the Treatment of Infections: A Report of 500 Cases, *J. A. M. A.* 122: 1217-1224 (Aug. 28) 1943.

9. Herrell, W. E.: Further Observations on the Clinical Use of Penicillin, *Proc. Staff Meet., Mayo Clin.* 18: 65-76 (March 10) 1943.

10. Florey, H. W., and Jennings, M. A.: Some Biological Properties of Highly Purified Penicillin, *Brit. J. Exper. Path.* 23: 120-123 (June) 1942. Florey, M. E., and Florey, H. W.: General and Local Administration of Penicillin, *Lancet* 1: 387-397 (March 27) 1943.

From the Division of Medicine, Mayo Clinic.

This paper, in a symposium on "Antibiotic Agents," is published under the auspices of the Section on Experimental Medicine and Therapeutics.

1. Fleming, Alexander: On the Antibacterial Action of Cultures of a *Penicillium*, with Special Reference to Their Use in the Isolation of *B. Influenzae*, *Brit. J. Exper. Path.* 10: 226-236 (June) 1929.

2. Dubos, R. J.: Studies on Bactericidal Agent Extracted from a Soil *Bacillus*: I. Preparation of the Agent; Its Activity in Vitro, *J. Exper. Med.* 70: 1-10 (July) 1939.

3. Chain, E.; Florey, H. W.; Gardner, A. D.; Heatley, N. G.; Jennings, M. A.; Orr-Ewing, J., and Sanders, A. G.: Penicillin as a Chemotherapeutic Agent, *Lancet* 2: 226-228 (Aug. 24) 1940.

this to be nonhygroscopic and further reported that it could be handled more conveniently than the sodium salt. They made use of it for local therapy. It was their impression, however, that the calcium salt investigated by them was unsafe for intramuscular and intravenous use. Nichols and I¹¹ recently examined a calcium salt of penicillin (Winthrop) and reported experimental and clinical trials. The potency of this calcium salt investigated by us was 146 Oxford units per milligram and the salt contained 5.6 per cent of calcium. This material had been found by the manufacturer to be quite safe for subcutaneous and intravenous administration to mice.

Using the tissue culture method for the study of cytotoxicity of bactericidal agents which we¹² previously described, Heilman and I found that the calcium salt was somewhat less toxic for cellular elements than the sodium salt of penicillin now commonly used. The decrease of the radius of migration of lymphocytes from lymph node explants as compared with the controls was 13 per cent when the calcium salt was used in concentrations of 1:1,000, whereas the decrease of the radius of migration with the same concentration of sodium salt was 27 per cent. Further, the calcium salt appears to be relatively stable. In our laboratories we were unable to detect any loss of activity of the calcium salt in the dry state in sealed ampules which had been stored at room temperature for fifty-six days. The material was kept away from the light. Because of these and other observations, we felt that the calcium salt should prove safe for intravenous and intramuscular therapy. In 12 of the 62 cases included in this report the patients received the calcium salt of penicillin by the intravenous drip method employed at the Mayo Clinic. In order to determine any possible toxic effect from the intramuscular use of the calcium salt of penicillin, the following study was made: To patients not included in this report the calcium salt in amounts of 11,000 Oxford units in 10 cc. of isotonic solution of sodium chloride was administered intramuscularly at three hour intervals. There was no evidence whatever of irritation of tissue.

DOSAGE AND METHODS OF ADMINISTRATION

Local Application.—The sodium and the calcium salt of penicillin as well as the broth filtrates containing penicillin are all satisfactory for local therapy. It appears from the reports now available that the calcium salt is superior to the sodium salt in this form of treatment. The reason is purely a question of stability and ease of handling of the material. The difference in the cytotoxicity of the two preparations is of no significance. Because many antibacterial agents of similar potency are easily available for local therapy, we have not felt justified in using the limited amounts of penicillin available for this purpose. Sulfonamide therapy has proved very satisfactory for the local treatment of bacterial infections. Other agents, such as gramicidin and the synthetic quaternary ammonium compounds, are also very satisfactory. The compounds just mentioned are far more stable than penicillin, and their preparation is not accompanied by the complex problems associated

with the production of penicillin. We therefore have used penicillin locally in only 2 cases. The results were satisfactory.

Intramuscular Administration.—No doubt repeated intramuscular injection of penicillin in doses of 10,000 to 20,000 Oxford units dissolved in 5 or 10 cc. of isotonic solution of sodium chloride or distilled water is reliable. Nevertheless this method has some disadvantages. Because penicillin disappears from the blood stream rather rapidly, this method of administration requires repeated injections of the material at three or four hour intervals throughout the entire twenty-four hours. This requires considerable time on the part of medical personnel. Further, if 20,000 units is administered every three hours in this fashion, the total daily dose will be 160,000 Oxford units per patient. This amount of penicillin in our experience is far in excess of that required to obtain satisfactory results in the treatment of infections, including septicemia. Therefore, in order to conserve the limited amount of penicillin available, we have used the intramuscular method of administration in only those cases in which the intravenous drip method was not feasible. Two patients were treated by means of the intramuscular method. One was an infant 10 days of age suffering with staphylococcal septicemia (120 colonies per cubic centimeter of blood). The patient recovered. The second patient was an infant 6 months of age suffering with extensive facial and orbital cellulitis due to *Staphylococcus aureus*. Suitable veins were not available to permit the use of the intravenous drip administration. The patient recovered.

Intravenous Administration.—Two methods of intravenous administration are possible. Penicillin in concentrated solutions (10,000 Oxford units per 10 cc.) administered every two or three hours has been advocated by some. This results in a daily dose of 80,000 to 120,000 units. This method is subject to the same disadvantages mentioned in the discussion of the interrupted intramuscular method of administration. Larger doses and repeated venipunctures are required, although satisfactory clinical responses may indeed be obtained.

If the interval between the repeated intravenous injections is longer than two hours, it is important to remember that there will be a period during which little or no penicillin is present in the blood. This in my opinion is undesirable, especially in the treatment of infections of the blood stream. In my experience the continuous or nearly continuous intravenous administration of pyrogen free penicillin is the most suitable method. For the treatment of moderately severe or severe infections 40,000 Oxford units per twenty-four hours has been found to be an adequate daily dose of penicillin. Half of the twenty-four hour dose is dissolved in 1 liter of isotonic solution of sodium chloride. The material may be administered in a 5 per cent solution of dextrose in triple distilled water; however, continuous administration of dextrose may produce venous irritation at times. We therefore administer the material in dextrose only in those cases in which the use of sodium chloride is undesirable. Initially, between 100 and 200 cc. of the material is administered at a fairly rapid rate. Following this the rate of injection is regulated to between 30 and 40 drops per minute. The second liter containing penicillin is attached to the

11. Herrell, W. E., and Nichols, D. R.: The Calcium Salt of Penicillin, Proc. Staff Meet., Mayo Clin. 18: 313-319 (Sept. 8) 1943.

12. Herrell, W. E., and Heilman, Dorothy H.: Tissue Culture Studies on Cytotoxicity of Bactericidal Agents: Effects of Gramicidin, Tyrocidine and Penicillin on Cultures of Mammalian Lymph Node, Am. J. M. Sc. 205: 157-162 (Feb.) 1943.

continuous intravenous system eight to ten hours later. Repeated venipunctures are avoided by allowing saline or dextrose solution to drip in slowly during the interval in which, for any reason, the subsequent penicillin has not been delivered to the patient's room. An 18 gage Lewisohn transfusion needle is inserted deeply

intravenous therapy by intrathecal administration of 5,000 to 10,000 Oxford units of penicillin once daily to patients under treatment for meningitis.

Dosage.—Only on two occasions in the treatment of 62 patients have we found it necessary to use more than 40,000 units per day. These two patients received between 40,000 and 60,000 units for one or two days, but in no instance has the daily dose exceeded this amount. It appears that the cases were fairly representative of the moderately severe and severe bacterial infections usually encountered. For example, 16 patients were suffering with septicemia, and the blood cultures of all were positive before treatment.

METHODS OF STANDARDIZING PENICILLIN

The commonly used methods for the standardization of penicillin have been reviewed by Foster and Woodruff.¹⁵ They discussed the principles, the merits and the disadvantages of the different bacteriologic methods now used. They pointed out that the serial dilution methods are wanting in accuracy and advocated a modified broth method devised in their laboratory. The turbidimetric method of Foster used by some is rather difficult for routine purposes. Probably the most commonly used method of assay of penicillin is that described by Abraham and his associates⁵ and is known as the Oxford method. The unit is that amount of penicillin which under the conditions of the assay gives an inhibition zone 24 mm. in diameter. The unit also



Fig 1—Administration of penicillin by the continuous intravenous drip method with patient recumbent. The patient represented received penicillin in this manner for eight days without withdrawal of the needle. He could move about with the needle in place.

into the vein and anchored with adhesive plaster. A simple arm splint is applied to keep the arm in position. This is tolerated well by the patient and renders this method of administration possible and not uncomfortable. Some patients receiving penicillin in this fashion may be allowed to sit up at times during the course of the therapy. It has been possible to administer penicillin without changing the needle or disturbing the apparatus for a period as long as eight days.

Intrathecal Administration.—Rammelkamp and Keffer¹³ made the interesting observation that penicillin could not be detected in the spinal fluid following intravenous administration of the drug to normal subjects. Nichols and I¹⁴ made observations which confirm their findings. We administered as much as 30,000 units of penicillin intravenously in a period of fifteen minutes to a patient who did not have any demonstrable lesions of the central nervous system, and we could not detect any penicillin in the spinal fluid removed thirty and sixty minutes after the intravenous injection. We have not determined whether or not the same finding obtains in diseases which involve the cerebrospinal apparatus, such as meningitis. At the moment, therefore, it seems advisable to supplement



Fig 2—Administration with patient sitting

may be expressed as that amount of penicillin which regularly inhibits the growth of a known inoculum of the test organism. The test organism used by the Oxford investigators was *Staphylococcus aureus*.

13 Rammelkamp, C. H., and Keffer, C. S.: The Absorption, Excretion and Distribution of Penicillin, *J. Clin. Investigation* 22: 425-437 (May) 1943.

14. Nichols, D. R., and Herrell, W. E.: Unpublished data.

15 Foster, J. W., and Woodruff, H. B.: Microbiological Aspects of Penicillin I Methods of Assay, *J. Bact.* 46: 187-202 (Aug) 1943.

Heilman¹⁶ has stated that one of the chief hazards in the methods commonly used is the maintenance of a suitable standard. Using the tissue culture technic, she has devised a method of titrating penicillin which does not require the use of a standard in the performance of the test. This method, which compares favorably with the Oxford method, is the one used in our laboratories for the titration of samples of penicillin. Unless one is interested in some particular problem of a research nature, it is not necessary in my opinion to know the penicillin content of the blood of a patient under treatment. When amounts of penicillin are detectable in the blood by the commonly used methods, the penicillin present is certainly in excess of the ordinary therapeutic requirements. The method described by Heilman is not suitable for the determination of the amounts of penicillin present in the blood and tissues. Her method has been found entirely satisfactory, however, for the determination of the potency of penicillin to be administered therapeutically. Since there is often a discrepancy between the estimated strength of a product at the time of its preparation and the actual strength at the time of its use, one should be prepared to titrate from time to time penicillin to be used clinically. This discrepancy between the estimated and the actual strength of the product is completely understandable in view of the great lability of the product. I am in complete agreement with Heilman that, because of the scarcity of penicillin, it is most important not to use more of it than is necessary. It is likewise most important to use enough. To be able to determine the strength of a preparation of penicillin at the time it is being administered is therefore essential and is the crux of the whole matter.

ANALYSIS OF SIXTY-TWO CASES

Penicillin has been used in the treatment of 62 patients suffering from various bacterial infections. As previously mentioned, in 50 cases the sodium salt and in 12 the calcium salt of penicillin was administered. Penicillin was used locally in only 2 instances. Because of the lack of suitable veins for administration by continuous intravenous drip, penicillin was administered by repeated intramuscular injection in 2 cases. In the remaining 58 cases penicillin was administered by the intravenous drip method previously described. The causative organisms isolated in these 62 cases and the results obtained from penicillin therapy are contained in table 1. The diagnosis in each of the separate groups and the results will be discussed separately.

Staphylococcus Aureus Infections.—In 28 cases *Staphylococcus aureus* was the organism isolated. Fourteen of the 28 staphylococcic infections were examples of staphylococcic septicemia, in all of which positive blood cultures were obtained before treatment. The results of treatment in the 14 cases of septicemia will be discussed separately. In the remaining 14 cases the blood cultures were negative, but in all but 2 the infections were acute, severe localized staphylococcic infections. The results were entirely satisfactory in 22 of the 28 cases. The result was doubtful in 2, and failure occurred in 4, 2 of which were examples of septicemia associated with clinical evidence of a valvular cardiac lesion at the time the treatment was begun.

The clinical diagnoses in these cases were as follows: extensive cellulitis of the face (Ludwig's) or the extremities in 16, infections of the urinary tract in 5, postoperative infection of a wound in 3, osteomyelitis in 2, cellulitis of the thoracic wall in 1 and chronic ulcer in 1.

Injection with *Neisseria Gonorrhoeae*.—Since the first report from the Mayo Clinic by Cook, Thompson and myself¹⁷ on the experimental and clinical effective-

TABLE 1.—Organism—Results of Treatment with Penicillin in Cases of Acute Localized Infection

Organism Isolated	Cases	Result		
		Recovery Satisfactory	Doubtful	Failure
<i>Staphylococcus aureus</i>	28	22	2	4
<i>Neisseria gonorrhoeae</i>	16	16	..	..
<i>Streptococci</i>				
Hemolytic.....	3	2	..	1
Anaerobic.....	4	4	..	..
Nonhemolytic.....	3	1	..	2
<i>Actinomyces bovis</i>	4	2	..	2
<i>Micrococcus</i>	2	..	1	1
No organism.....	2	1	..	1
Total.....	62	48	3*	11*

* Five of the eleven results listed as failures and one of those listed as doubtful occurred in cases of acute or subacute bacterial endocarditis.

ness of penicillin in the treatment of gonorrheal infection resistant to sulfonamide compounds, further clinical experience indicates that penicillin is highly effective in this condition. Cook, Pool and Herrell¹⁸ have reported the results in detail. Penicillin has been used in a total of 16 cases. In no instance did failure occur. The duration of treatment is seldom more than forty-eight to seventy-two hours. It is never necessary to use more than 100,000 to 150,000 Oxford units of penicillin in these cases. Complete cures have been obtained by using as little as 65,000 units. The intramuscular administration of penicillin is probably quite well adapted to this type of case. On the other hand, we have used the intravenous drip method, which permits a longer period of treatment than is possible with the same amount of penicillin usually necessary for a twenty-four hour course of intramuscular injections. This seems desirable since we continue treatment to the time when the first negative cultures have been reported.

Streptococcic Infections.—Because of the effectiveness of the sulfonamide compounds against hemolytic streptococcic infections, we did not find it necessary to use penicillin in more than 3 cases of this type. In the first instance the diagnosis was multiple hepatic abscesses; the result was unsatisfactory. In the second the diagnosis was extensive cellulitis of the face (Ludwig's) without bacteremia, and in the third the diagnosis was extensive cellulitis of the face with septicemia. Both the patients with cellulitis recovered.

A partially or completely anaerobic streptococcus was isolated in 4 cases. Three of the patients were suffering with osteomyelitis. One had postoperative septi-

17. Herrell, W. E.; Cook, E. N., and Thompson, Luther: Use of Penicillin in Sulfonamide Resistant Gonorrheal Infections, *J. A. M. A.* 122: 289-292 (May 29) 1943.

18. Cook, E. N.; Pool, T. L., and Herrell, W. E.: Further Observations on Penicillin in Sulfonamide Resistant Gonorrhea, *Proc. Staff Meet., Mayo Clin.* 18: 433-437 (Nov. 17) 1943.

16. Heilman, Dorothy H.: Unpublished data.

emia. Satisfactory results were obtained in all 4 instances.

There were 3 cases in which a nonhemolytic streptococcus was the organism isolated. In 2 instances the diagnosis was subacute bacterial endocarditis. In both of these the treatment resulted in failure. In 1 instance the diagnosis was extensive cellulitis of the mouth and tongue; the patient recovered.

Miscellaneous Infections.—In 4 cases actinomycosis was treated with penicillin. In 1 instance the infection was abdominal actinomycosis complicated by carcinoma of the colon; the result was unsatisfactory. In 3 instances the diagnosis was maxillofacial actinomycosis. There were one failure and two recoveries.

In 2 cases a micrococcus was isolated repeatedly from the blood on culture, and both patients were suffering with subacute bacterial endocarditis. The treatment with penicillin was ineffective in 1 patient. The other patient is still living and in spite of the presence of endocarditis the blood cultures are negative. The result is listed as doubtful.

In 1 case an overwhelming gas gangrene infection was present. The patient died before bacteriologic studies could be made and before completion of intravenous administration of 1 liter of saline solution containing 20,000 units of penicillin.

TABLE 2.—Results of Penicillin Therapy in Cases of Septicemia

Organism Isolated	Cases	Recovery	Failure
Staphylococcus aureus.....	14	12	2
Hemolytic streptococcus.....	1	1	—
Anaerobic streptococcus.....	1	1	—
Total.....	16	14 (88%)	2 (12%)

In another case in this series positive bacteriologic results could not be obtained before penicillin was administered. However, the patient was suffering with extensive cellulitis of the face and mouth (Ludwig's). The patient received 240,000 units of penicillin by the intravenous drip method over a nine day period. This patient recovered.

The Question of Surgical Drainage.—On excluding the 16 cases of gonorrhea in which treatment with penicillin was given because the infection was resistant to sulfonamide compounds, there remain 46 instances of infection caused by other pathogenic bacteria. In some of these 46 cases, the infection localized and was susceptible of drainage; however, in only 10 such cases was drainage instituted. Even some of these 10 patients, I believe, would have recovered without drainage.

PENICILLIN IN THE TREATMENT OF BACTEREMIA

Since bacteremia or septicemia constitutes a most serious problem in the treatment of infections, it is appropriate to analyze thoroughly the results that followed the use of penicillin in these cases. In nearly every instance one or more of the sulfonamide preparations had been administered without demonstrable benefit. Included in this group were all the patients whose blood cultures were positive before or at the time of institution of penicillin therapy. The blood cultures in 20 of the 62 cases included in this report were positive.

Four of these cases were examples of subacute bacterial endocarditis, and in spite of temporary sterilization of the blood stream following the administration of penicillin we cannot report at this time a single recovery. These 4 cases are therefore excluded henceforth in the discussion of the results in bacteremia.

In 14 of the 16 cases of septicemia (table 2) the organism isolated from the blood was Staphylococcus aureus. Hemolytic streptococci were isolated in one and anaerobic streptococci in another. Fourteen of the 16 patients suffering with septicemia recovered; 2 died. It is significant that the 2 patients who failed to recover had definite clinical evidence of a possible valvular cardiac lesion at the time penicillin therapy was instituted.

One of these patients was a woman aged 31 who was admitted after having been under treatment with sulfonamide therapy for eighteen days because of staphylococcal septicemia which apparently started from an abscess in the hand. At the time of her admission her blood cultures were negative, and penicillin was not administered. Several days after admission she was delivered of a normal but premature child. At the time of her admission a definite cardiac murmur was present and there were other physical manifestations suggestive of acute endocarditis. At the onset of labor a highly septic fever developed, and blood cultures revealed forty-five colonies of Staphylococcus aureus per cubic centimeter. Subsequent to this penicillin therapy was instituted, but the patient failed to respond favorably and died after three days of treatment. Necropsy revealed acute mitral bacterial endocarditis with multiple abscesses throughout most of the viscera.

The second patient who failed to recover was a man aged 64 under observation for a severe infection of the urinary tract due to Staphylococcus aureus. A positive blood culture for Staphylococcus aureus was obtained on the fourth day after his admission. On the fifth day penicillin therapy was started. At the time penicillin therapy was begun a definite systolic murmur could be heard, and a diagnosis of possible acute endocarditis was made. After receiving 30,000 units of penicillin by the intravenous drip method, the patient died. He had been treated for only a little more than twelve hours. Necropsy revealed acute vegetative endocarditis and multiple abscesses in both kidneys.

It seems likely that both of these patients were suffering with acute vegetative endocarditis at the time penicillin therapy was initiated. In our experience vegetative endocarditis has not developed during treatment with penicillin. Although this group of cases of septicemia is small, it is gratifying to experience recovery of 14 of 16 patients suffering with such a severe infection (recovery rate 88 per cent).

The daily dose of penicillin administered in these cases has been, as a rule, between 30,000 and 40,000 units in twenty-four hours. In the cases of septicemia the total amount of penicillin administered by the intravenous drip method varied between a minimum of 160,000 units and a maximum of 473,000 units. The average duration of treatment of the patients suffering from septicemia was ten and a half days. It is our practice to continue the administration of penicillin until two successive negative blood cultures have been obtained and the temperature has reached normal.

The age of the patient does not appear to be of any prognostic significance under adequate penicillin therapy. The youngest patient treated for septicemia was a child 10 days of age. The oldest patient was 75 years of age. It seems reasonable to assume that satisfactory results can be obtained by using the daily dosage recom-

mended and administering the material by the intravenous drip method. This permits penicillin to be delivered into the blood stream continuously or nearly so, a very desirable factor in the treatment of patients with bacterial infections, especially those whose blood cultures are positive. The average total amount of penicillin used per patient for severe infections is slightly less than 300,000 units. It seems unnecessary to use more if satisfactory results can be obtained with this amount administered by the method advocated.

TOXIC REACTIONS

Chills and Fever.—Chills and fever have been reported by other investigators. All of the material used in our work has been pyrogen free penicillin. In no instance have we observed this reaction.

Thrombophlebitis.—We observed a mild venous irritation in 3 of the 62 cases reported. In all 3 instances this reaction promptly subsided after the intravenous drip had been changed to another site. It is interesting that this occurred only in cases in which penicillin was being administered in a 5 per cent solution of dextrose. Prolonged administration of dextrose itself may result in irritation of veins in some instances. Stronger solutions of penicillin than we have used may be responsible for some of the phlebitis reported to result from penicillin therapy. It is quite possible also that substances introduced in the processing of penicillin, if still present in the final product, may explain this reaction. I am not prepared to state with certainty that the possibilities just mentioned are the true factors involved in "penicillin phlebitis." Certainly the reaction has not been at all troublesome in our experience.

SUMMARY AND CONCLUSIONS

It is apparent that penicillin is a highly effective antibacterial agent against susceptible pathogens. Among the cases in which penicillin was used were infections due to *Staphylococcus aureus*, *Neisseria gonorrhoeae*, streptococci, actinomycetes and micrococci. Satisfactory results were obtained in 48 of the 62 cases. The results were doubtful in 3, and failure or death occurred in 11 instances, in 5 of which the condition was acute or subacute bacterial endocarditis. If the latter 5 cases are excluded, the cases in which the results were satisfactory would number 48 of 57 (84 per cent).

Both the sodium and the calcium salt of penicillin have been used in the treatment of the bacterial infections reported. Either of these salts may be applied locally or administered intravenously or intramuscularly. The calcium salt appears to be the more stable.

The experience in this group of cases seems to justify the conclusion that 40,000 units of penicillin per day is sufficient in the treatment of the infections described. In our hands the intravenous drip method of administering penicillin has been the most satisfactory. In some instances intermittent intramuscular administration may be equally satisfactory. However, if experience proves that larger doses are required for the intermittent intramuscular method than for the intravenous drip method, the former is not the one of choice at the present time. Penicillin should be reserved so far as possible for infections resistant to sulfonamide compounds. Penicillin therapy is no substitute for sound medical and surgical judgment in the treatment of bacterial infections.

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THE CLINICAL USE OF PENICILLIN

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In August 1943 penicillin supplied by the Office of Scientific Research and Development was made available, through the Committee on Chemotherapeutic and Other Agents¹ of the National Research Council, for clinical investigations at Stanford University Hospital. The ensuing report largely concerns our experiences with penicillin, with reference especially to continuous subcutaneous and intravenous infusions, since the subcutaneous and intravenous routes have not been extensively used by most investigators.

Penicillin has been furnished to us as the sodium salt. This is a brown or yellow powder, put up in sealed glass ampules, which is extremely soluble in water and in saline or dextrose solution; 10,000 units or more is readily taken up in 1 cc. of fluid. The material is unstable in the air and very hygroscopic; its potency is impaired by heat and in acid mediums.² Therefore the sealed ampules must be preserved in the refrigerator until used; however, a day's dose, made up in the proper solution, may safely be kept in the cold. Various lots of the sodium salt of penicillin have differed greatly in color when dissolved. The earlier batches especially yielded intensely yellow or even brownish solutions. The material more recently received has been almost colorless. It is our impression that these pale solutions contain less of certain impurities which may be associated with clinical reactions (see the following section).

The exact constitution of penicillin has not yet been worked out. Hence the material cannot be standardized by chemical means but is assayed by its biologic effect. The clumsy Florey (Oxford) unit—the amount of penicillin compared with an arbitrary standard which completely inhibits the growth of a test strain of *Staphylococcus aureus*—is still used and probably will hold its place until a chemically standardized product is available. In Florey's original material there were 40 to 50 units per milligram³; material which runs 700 to 1,000 units per milligram has now been prepared. Most of our material for which unitage was stated had a potency of about 300 units per milligram. A few other points should be kept in mind: first that penicillin, in large part at least, exercises a direct bactericidal action; second, that some preparations have immense potency and are effective in dilutions of over 1 to 100,000,000.

Those who have not actually worked with penicillin may have the idea that its use is a simple matter. This is not at all the case. We soon found that the

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Dr. Chester S. Keefer, chairman of the Committee on Therapeutic and Other Agents gave assistance and advice.

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1. Keefer, C. S., and others: Penicillin in the Treatment of Infections, J. A. M. A. 122: 1217 (Aug. 28) 1943.

2. Abraham, E. P.; Chain, E., and Holiday, E. R.: Purification and Some Physical and Clinical Properties of Penicillin, Brit. J. Exper. Path. 23: 103 (June) 1942.

3. Abraham, E. P., and others: Further Observations on Penicillin, Lancet 2: 177 (Aug. 16) 1941.

patients should be housed in one physical unit and that a special "penicillin team" was necessary in order to carry out the treatments effectively. The duties of this team have been:

1. To answer numerous calls and to interview physicians desiring to send patients for penicillin therapy in regard to the suitability of these prospects.
2. To make preliminary examinations (physical and bacteriologic) in order to identify the infection and to establish proper records.
3. To plan the dosage and the route of penicillin therapy and to organize any ancillary treatment necessary in cooperation with surgeons, orthopedic physicians and other specialists.
4. To make up the total daily dose of penicillin for each patient in the desired amount and in the proper solvent. To keep records of the commercial lot used for each patient. To decide when treatment should be stopped.
5. To set up infusion sets and introduce needles for subcutaneous and for intravenous flow. To supervise the apparatus and see that it functions properly day and night.
6. To follow the clinical course and bacteriologic findings and plan therapy from day to day.
7. To measure blood levels of penicillin and the urinary excretion of the substance.
8. To keep and compile adequate records and to follow patients as long as necessary after treatment.

When 4 to 7 sick persons were under treatment at the same time the team found that they had their hands full. It is our feeling that at present best results will not be obtained by the occasional treatment of a single patient by a doctor not fully "at home" with the problems of penicillin therapy.

ROUTES AND TECHNIC OF ADMINISTRATION

Because of the rapid excretion of penicillin (see a later paragraph) frequent injections are necessary unless the material is given by continuous infusion. The standard procedure is to inject one eighth of the twenty-four hour dose deep into the gluteal (or other) muscle or into a vein every three hours day and night. Following an intravenous injection the blood level of penicillin promptly rises to a considerable height. According to the observations of Rammelkamp and Keefer⁴ values of 1 or 2 Florey units per cubic centimeter of serum may be attained with a dose of 20,000 units, but there is a prompt drop so that within an hour or two barely measurable amounts remain. Following an intramuscular injection the blood level is lower but more sustained. At any rate it is to be noted that with intermittent injections one obtains peaks followed promptly by periods during which little if any penicillin remains in the blood stream. Whether such a state of affairs is less or more effective than a continuous, even if submaximal, blood level is not yet known. Both methods have produced satisfactory results, as will be pointed out.

One great disadvantage of injecting penicillin at three hour intervals is the inconvenience of this procedure. Either the doctor or a trained nurse must be available all night; if several patients are simultaneously under treatment it requires nearly the full time of some one to make the injections. Intramuscular injections are usually given with penicillin in high concentration—as much as 5,000 units per cubic centimeter of water or saline solution; they are not uncommonly followed by some local discomfort, and the patient also may be disturbed by the frequent needling. One man who was treated at various times by

continuous subcutaneous and intravenous infusion and later by intermittent intramuscular injections objected to the latter procedure as the most annoying. Intermittent intravenous injections are usually arranged so that the dose (about 15,000 units) is given in 10 to 20 cc. of isotonic solution of sodium chloride.

Continuous Subcutaneous Infusion.—The subcutaneous administration of penicillin by the drip method has been extensively used in the Stanford clinic. The dose for a twenty-four hour period is prepared and given as follows:

Sterile 1,000 cc. bottles of isotonic solution of sodium chloride or 5 per cent dextrose are procured. We have used commercial products which are stated to be pyrogen free. If the dose for the day is 200,000 units or less, the total amount is dissolved in 1,000 cc. of fluid. We use saline solution unless there is a contraindication to the introduction of salt. The usual apparatus for subcutaneous clysis is set up with a dropper inserted so that the exact rate of flow of the solution can be checked. The system is filled with about 200 cc. of the penicillin solution, and the needle is introduced into the loose subcutaneous tissue of the thigh. The speed of flow is then so regulated that it will take twenty-four hours for the entire quantity of 1 or 2 liters to run in. If the total is 1,000 cc., the solution runs at approximately 10 drops per minute. Because of possible deterioration at room temperature, the bulk of the solution is kept in the refrigerator and from time to time amounts of 100 to 200 cc. are added to the solution in the infusion bottle. The attendants must watch the site of injection carefully to see that there is no large local collection of unabsorbed fluid; if collection occurs, the needle should be reinserted at another point. In our experience this rarely needs to be done oftener than every six to twelve or even twenty-four hours. A good deal of supervision of the whole procedure is necessary. The flow usually does not remain entirely constant over long periods; the number of drops per minute must be increased or decreased from time to time so as to consume as nearly as possible exactly twenty-four hours in introducing the entire dose. Before the subcutaneous drip is started we often give a single priming dose of 15,000 to 20,000 units into a vein to raise the blood level quickly.

Advantages and Objections to the Foregoing Method.

—In some of the early cases especially the site of injection became extremely painful even when the flow was well regulated. As the solutions of penicillin are isotonic and neutral in reaction, the explanation was at first not clear. It is possible that some of the early lots of penicillin, which were highly colored (brownish yellow to yellow), contained irritating substances; there has been much less trouble with recent, more highly purified products which in the dilutions used have only a faint yellowish tinge. Small amounts of procaine hydrochloride added to the penicillin infusion also seem to have been effective in preventing local pain. In certain of the early cases there were sharp febrile reactions, the temperature rising to 39 to 40 C. (102.2 to 104.0 F.). Some of these reactions may have been due to pyrogenic saline solution or to stale infusion sets but more likely were caused also by impurities associated with the penicillin. Such reactions too are less frequent with recent lots.

The obvious advantages of continuous subcutaneous clysis are (1) the procedure once started is simple and can be watched by a nurse or other attendant, (2) it involves but little discomfort to the patient as frequent needling is avoided, and (3) the extremities do not have to be immobilized when the patient sleeps as they do with continuous intravenous drip. We have treated patients for several days to a week by the continuous subcutaneous drip without any technical difficulty.

The question of greatest importance is whether penicillin is as effective when given subcutaneously as

4. Rammelkamp, C. H., and Keefer, C. S.: The Absorption, Excretion and Distribution of Penicillin, *J. Clin. Investigation* 22: 425 (May) 1943.

when introduced into the blood stream. Rammelkamp and Keefer⁴ report the prompt recovery in the urine of about two thirds of intravenously injected penicillin. Observations in our clinic by Rantz and Kirby⁵ indicate that under certain conditions the excretion of penicillin after intravenous injection approaches 100 per cent. It is possible that penicillin given subcutaneously may stay in the tissues longer and perhaps exercise some effect even though the blood levels are lower than after intravenous injections. This part of the subject is still under investigation, and much more work needs to be done. At any rate the values of penicillin per cubic centimeter of plasma⁶ when 100,000 units is given in twenty-four hours are approximately 0.05 unit (subcutaneous clysis) and 0.10 unit (intravenous drip). It is our feeling at present that while the subcutaneous route is adequate in gonococcal and perhaps some other infections it should not be used in staphylococcal sepsis, in which relatively high blood levels are probably necessary in order to extirpate the infection. If the continuous intravenous drip cannot be given, intermittent intramuscular injections, perhaps combined with subcutaneous clysis, would be the best alternative.

Continuous Intravenous Injection.—The intravenous route for administering penicillin by the drip method seems to us the route of choice in severe septic infections. The preparation of the material and that of the apparatus are the same as for subcutaneous infusion except that an intravenous needle is used. With cooperative patients one can use the small veins of the hand or the foot; for the most part the only immobilization of the needle necessary is that obtained with a bit of adhesive tape and a light bandage; at night a splint is used. With restless, delirious or uncooperative subjects a partial cast is necessary.

Our earlier patients treated by intravenous drip often had violent febrile reactions. Bouts of this sort have been much less frequent with the recent lots of penicillin. In some of the early patients too thrombosis of veins occurred. This is now largely avoided by (1) availability of less irritating penicillin, (2) giving the material in no higher concentration than 100,000 units per liter and (3) not allowing the needle to stay more than twelve to twenty-four hours in the same vein. One patient became edematous after five days of intravenous therapy. It was calculated that he had received from 20 to 30 Gm. of sodium chloride daily; a change from saline to 5 per cent dextrose solution as a solvent for the sodium salt of penicillin was followed by disappearance of the swelling.

In 1 patient intrasternal drip was used. This method deserves further trial. We have employed a combination of methods in the same case, such as intravenous drip by day and subcutaneous infusion at night.

Penicillin is highly effective when injected into closed cavities in which the drug can be retained. In empyema, for example, the injection of 25,000 to 50,000 units may be followed by prompt sterilization, as in the following case:

CASE 1.—A 7 year old child had pneumococcal pneumonia about seven weeks before her entry into Stanford University Hospital. She had been treated with a sulfonamide compound without recovery. Empyema was diagnosed at that time but nothing further was done. On admission the child was pro-

trated, with typical signs of fluid in the left thoracic cavity, high irregular fever, serious anemia and leukocytosis. Fluid removed from the chest showed a pure growth of the type 1 pneumococcus. Thoracotomy was done and a tube inserted, but no improvement took place and the child seemed to be failing rapidly. On the sixth hospital day 30,000 units of penicillin in 50 cc. of saline solution was injected through the drainage tube, which was then closed with a clamp. Within twelve hours she was clinically well; her temperature was normal and remained so, and all fluids subsequently obtained from the chest were sterile. Several more doses of penicillin were injected through the tube, but they were probably unnecessary.

We have had no experience with injecting penicillin into infected joint cavities or intraspinally in meningitis. The treatment will doubtless be highly effective in certain cases. On the other hand, instillation of penicillin in chronic osteomyelitic sinuses has so far in our hands been useless, possibly because the organisms are not reached, possibly because the drug drains out before it acts in effective concentration. Tiny catheters inserted to the very depths of a sinus and flushed at frequent intervals with solutions of penicillin did not solve this problem.

DOSAGE

The dosage of penicillin has been largely arbitrary, and minimum effective amounts for various infections remain to be worked out. As long as the material is so difficult to prepare, economy is of the utmost importance. The penicillin commission at first advised that approximately 15,000 units be injected every three hours or roughly 100,000 units daily. We have used from 50,000 to 400,000 units daily in different situations largely on an empirical basis. Extensive studies by Rantz and Kirby⁵ of blood levels following varying doses of penicillin show that even after continuous intravenous infusion at the rate of 20,000 units per hour plasma levels of only 0.4 to 0.5 Florey unit are obtained. With injection at the average rate of 100,000 units per day the level is only about 0.1 unit. As penicillin may be effective in the test tube in dilutions of over 1:100,000,000 it is impossible as yet to say definitely whether blood levels above some critical value increase therapeutic efficiency. However, Rammelkamp and Keefer⁷ found that with staphylococcal infection a blood level of at least 0.15 unit per cubic centimeter is necessary to obtain maximum bactericidal effect. Our largest doses were given for serious staphylococcal infections, after previous experience had shown how difficult it is to extirpate the organisms, partly with the hope of quicker and more complete effect and partly with the idea that "drug fastness" of surviving germs would be less likely to occur. On the other hand, it seems clearly established that most patients with acute and subacute gonorrhea can be sterilized (of gonococci) and clinically cured in a period of one or two days by doses of from 50,000 to 200,000 units given by a number of routes.

In certain types of infections, as will be pointed out presently, it is extremely difficult to tell when the patient is cured. In staphylococcal sepsis, especially, bacteria may fail to grow in blood cultures, demonstrable lesions may heal, temperatures may decline or be normal and still within a few days after treatment is stopped blood cultures are again positive and lesions recur. This is especially true when bone is involved. In one case a particularly interesting phenomenon was

5. Rantz, L. A., and Kirby, W. M. M.: To be published.

6. The concentrations of penicillin in the blood and the urine were determined by a modification of the method of Rammelkamp (Proc. Soc. Exper. Biol. & Med. 51:95, 1942) and by a method devised by one of us (Kirby).

7. Rammelkamp, C. H., and Keefer, C. S.: Penicillin: Its Antibacterial Effect in Whole Blood and Serum for Hemolytic Streptococcus and Staphylococcus Aureus, J. Clin. Investigation 22:649 (Sept.) 1943.

observed. Blood cultures negative after treatment with penicillin was stopped became positive again after a few days even though the patient's temperature was practically normal. The staphylococci under these conditions grew out very slowly; the colonies were not visible until the seventh to tenth day, as if the organisms had been altered in some way, perhaps partially inhibited.

A final point in regard to dosage is whether it should vary with the age and the size of the patient. Here again there are no conclusive data but we are inclined to base the dosage mainly on the character and the severity of the infection.

TOXICITY

We have observed no toxic effects from penicillin. Thrombosis of veins and fever and local irritation caused by impurities, pyrogenic water or stale infusion sets have, as pointed out in an earlier paragraph, occurred at times but these do not seem to be essential effects of the drug. One is completely delivered from the sort of worry he has when using sulfonamide compounds or arsphenamines; there seems to be no injury of kidneys, liver, bone marrow or brain, and no cutaneous rashes have been seen in our cases with the exception of urticaria in 1 instance. Even such a large daily dose as 400,000 units is a minute fraction of the amount of penicillin which has been found to be toxic in animals.

RESULTS

Penicillin has been reported to be effective against infections with certain strains of the pneumococcus, the hemolytic streptococcus, the gonococcus, the meningococcus and the staphylococcus.¹ Some nonhemolytic streptococci seem to be little affected, and the result in *Streptococcus viridans* endocarditis has, like that with every other measure, been a failure. Unfortunately the colon-typhoid group seems definitely not affected. As to certain other organisms there have been conflicting reports; with regard to viruses and molds the full potentialities have not yet been explored. The material is said to be useless in malaria. In primary syphilis treponemes rapidly (in six to fifteen hours) disappear from surface lesions, which heal in ten days to two weeks; the ultimate results are of course not yet known.

Our experience has included infections with the gonococcus, the streptococcus, the pneumococcus, the staphylococcus and *Treponema pallidum* and can be best presented by illustrative case reports.

Gonococcal Infections.—It is now well established that penicillin is extremely effective in gonococcal infections.⁸ It is especially useful in those in which the organisms have become resistant to the action of sulfonamide compounds. The following 2 cases show that even after infection has been present for months it can still be rapidly controlled:

CASE 2.—A 25 year old woman entered the hospital with a history of gonorrhea of two months' duration. For three weeks there had been excessive vaginal discharge, severe pain in the lower right quadrant of the abdomen and fever. Intensive treatment with sulfadiazine, hot douches and diathermy had failed to alleviate the condition. There was pronounced tenderness in the right lower quadrant and on pelvic examination there was tenderness in both adnexal regions. There was moderate leukocytosis, and many gonococci were grown in cultures of material from the cervix. The diagnosis was subacute

gonococcal pelvic inflammatory disease, and 180,000 units of penicillin was given by subcutaneous infusion over a period of seventy-two hours. Within twenty-four hours after the start of treatment she felt well, the abdominal pain had practically disappeared, the temperature, which had been 100 F., fell to normal and cultures of material from the cervix were negative. On discharge from the hospital one week later she seemed entirely well.

The case illustrates very rapid cure in a woman of subacute, well entrenched gonococcal infection which had been resistant to all other modes of therapy. It is to be noted that the subcutaneous route was effective.

CASE 3.—A man aged 34 had been treated two months previously with full doses of sulfathiazole for acute anterior urethritis with an apparently good result. When seen by us there was only a trace of thin discharge with some tenderness of the epididymis. However, cultures of both urine and prostatic secretion yielded many colonies of gonococci. He was treated with 100,000 units of penicillin by continuous intravenous drip over a period of twenty-four hours, following which on two occasions cultures of urine and prostatic fluid yielded no gonococci. The clinical residue of symptoms promptly disappeared. There was decided improvement of his general well being.

A subacute gonococcal urethritis, prostatitis and epididymitis of two months' standing, resistant to treatment with sulfonamide compounds, was clinically and bacteriologically cured in twenty-four hours.

Another patient with fresh gonococcal urethritis and subacute arthritis of the wrist was promptly cured of his urethritis, but the arthritis persisted. The joint trouble had not been proved, however, to be gonococcal.

In summary, then, some of the most reliable and prompt results of penicillin therapy are obtained in patients with fresh or subacute gonococcal infection. In many patients, including those in whom the gonococci are resistant to treatment with sulfonamide compounds, a total quantity of 60,000 to 100,000 units given in divided doses intramuscularly or by continuous subcutaneous or intravenous drip is effective. Needless to say, a careful clinical and bacteriologic follow-up should be conducted on these patients preferably for several months.

Streptococcal Infections.—The wide field of streptococcal infections is only beginning to be explored. Hemolytic streptococci are perhaps less readily controlled than gonococci but are more easily controlled than staphylococci. This is a general statement subject to many exceptions depending on the type and the extent of the lesions. *S. viridans*, especially in subacute bacterial endocarditis, is little if at all affected. The following case shows, however, that penicillin may exert a favorable influence on a severe infection with nonhemolytic streptococci:

CASE 4.—A man 50 years old was hospitalized from June 14 to July 19, 1943 for treatment of a subphrenic abscess on the right side, which had probably developed on the basis of an undiagnosed rupture of the appendix. Following surgical drainage and administration of sulfadiazine he made what was believed to be an uneventful recovery. On August 20 he returned complaining that he had been ill with chills and fever for the three previous days. There were high "septic" fever and definite leukocytosis, but a blood culture was sterile. The abdomen was explored and at least three abscesses were found in the left lobe of the liver from which pus was recovered that yielded a pure growth of an anaerobic nonhemolytic streptococcus. The site of the old subdiaphragmatic abscess was explored and was found to contain a little pus. Both incisions were drained, and sulfadiazine was given, but the patient failed to improve. He was desperately ill, and since the organisms isolated from the hepatic abscesses were shown in vitro to be very sensitive to penicillin, administration of this material was

8. Mahoney, J. F.; Ferguson, C.; Buchholtz, M., and Van Slyke, C. J.: The Use of Penicillin Sodium in the Treatment of Sulfonamide Resistant Gonorrhea, *Am. J. Syph., Gonorr. & Ven. Dis.* 27: 525 (Sept.) 1943.

begun on the eighth hospital day. He received from 50,000 to 200,000 units daily, mostly by subcutaneous and intravenous routes, for seven days—a total of 600,000 units of penicillin being given. During treatment he seemed much improved generally but continued to have an irregular fever, the temperature rising to 102 to 104 F. daily. Soon after the penicillin therapy was discontinued, however, his temperature became lower, and since *Escherichia coli* was now demonstrated in the drainage from his incisions, sulfadiazine was again administered in the usual dosage. He improved steadily; his temperature became normal, and his incisions healed. He left the hospital on August 22, thirty-three days after the start of penicillin therapy. On October 15 he wrote enthusiastically that he was entirely well.

It is extremely difficult to evaluate the effect of penicillin in this case. It certainly did not produce an immediate cure, but it seemed to "turn the tide" in a patient who all observers felt was moribund.

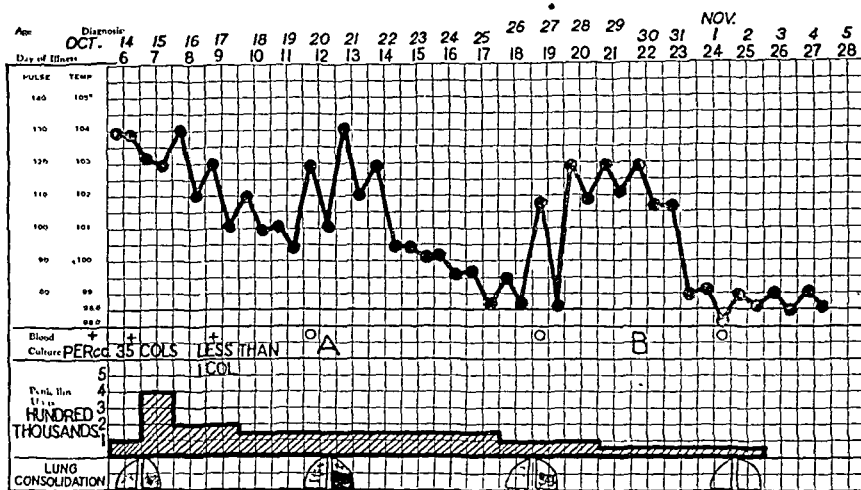
Staphylococcal Infections.—Staphylococcal infections, although undoubtedly responsive to penicillin, present an extremely difficult problem. In severe infections several weeks of intensive treatment may be necessary before a cure is achieved. Even then what appears to be a cure may be spurious, and organisms left dormant may revive and reinitiate active infection. The explanation of this peculiarity of staphylococci in relation to penicillin may be related to test tube experiments which have shown that even large doses of the drug fail to kill quite all the organisms if the inoculum is heavy. The theoretical aspects of this interesting fact have been discussed by Rammelkamp and Keefer⁷ and others but cannot be gone into further here. It is also possible that surviving organisms may become penicillin resistant.

At any rate severe staphylococcal infections seem definitely to fall into two groups as regards response to penicillin. If the lesions are fresh and not walled off by heavy sinus tracts, or if they are accessible to thorough surgical evacuation, cures may be achieved even in desperately ill patients with multiple foci and bacteremia. If, on the other hand, chronic bone lesions, especially deep sinuses with thick walls and sluggish drainage, are present and cannot be surgically extirpated, it is much more difficult to accomplish anything.

Doses for staphylococcal infections must be considerably higher than those which are effective, for example, in gonorrhea. It is our feeling at present that for severe staphylococcal disease in an adult 300,000 to 400,000 units per day should be given until things are definitely on the mend and that a dosage of 150,000 to 200,000 units a day thereafter should be continued until the patient is well. Such doses are necessary to reach or surpass the blood level of 0.15 Florey unit per cubic centimeter of blood which Rammelkamp and Keefer⁷ found to be necessary to achieve maximal killing of staphylococci in vitro. The intravenous rather than the subcutaneous route should be used for continuous infusion. If there is any contraindication to the introduction of large amounts of fluid, intramuscular injections of a concentrated solution of penicillin can be given. These principles are illustrated in the following cases.

CASE 5.—The patient was a 31 year old laborer who appeared moribund, and the history was obtained indirectly. Five days previously a carbuncle developed in the left scapular region. He rapidly became gravely ill with chills, fever, delirium and stupor. Two days later the carbuncle was incised, and he was given full doses of sulfathiazole. The blood culture was said to be positive. He did not respond and was sent into Stanford University Hospital. He was a red faced, sweating, dehydrated man, apparently dying. A huge fiery carbuncle with induration 20 cm. in diameter had been incised, and there was drainage of thin pus from which *Staph. aureus* was grown. There were scars of small furuncles on the right hand and arm. The respirations varied from 50 to 80 per minute, and there was dulness at the base of the right lung with many rales, and scattered patches of rales were heard through both lungs. The leukocyte count was 18,000, and the blood on culture yielded 35 colonies of *Staph. aureus* (coagulose positive) per cubic centimeter. The diagnosis was staphylococcal sepsis with bacteremia, carbuncle and extensive staphylococcal pneumonia (metastatic).

Penicillin was given by intravenous drip at the rate of 400,000 units for the first day, later decreasing (see chart) to 150,000 units and finally to 50,000 to 60,000 units daily. A total of 2,560,000 units was given over a period of twenty days. For the first nine days there was no notable improvement although



Course in case 5.

the patient seemed a little less toxic. The carbuncle resolved steadily, but pneumonia continued and there were frank signs of solidification of the lower lobe of the right lung. On the ninth day there was amazing improvement; the temperature fell rapidly, the patient became bright and said he felt well, and the signs of disease in the lungs began to resolve. By the twelfth day the temperature was normal. From the fifteenth to the seventeenth day elevations up to 39.5 C. (103.1 F.) recurred, but the temperature dropped immediately when a fresh infusion set was used. By the twentieth day he seemed cured; the lungs were almost clear, the carbuncle was healed and the temperature was normal. The accompanying chart shows his course graphically.

This is the sort of staphylococcal infection, sulfathiazole resistant and almost invariably fatal, which may respond brilliantly to penicillin. Note that there were no old walled off lesions. Two other points are important: In spite of large doses of penicillin there was not much change for over a week; this is the rule in staphylococcal sepsis of this type, contrasting with the "overnight" cure of gonorrhea. Infusion sets should be changed frequently, as molds and other organisms may grow in penicillin and produce pyrogenic material.

CASE 6.—A 15 year old boy entered the hospital for penicillin therapy because of chronic osteomyelitis. Lesions had been recurring for twenty-six months, involving the left ankle, knee and groin, the right ankle and thigh and the back. On entry

there were three sinuses draining greenish pus from which *Staph. aureus* (coagulase positive) was grown. One sinus ran deep into the spine. All were associated with chronic destructive lesions in bone, as definitely shown in roentgenograms. There had been numerous surgical operations in the past. He was a chubby boy, slightly pale. Physical examination showed nothing remarkable except the scars and sinuses. There were slight elevations of temperature and slight anemia (hemoglobin content 72 per cent, Sahli). Between September 21 and November 1 he received 2,225,000 units of penicillin mostly by intravenous drip but at times by subcutaneous clysis. The daily dose varied from 60,000 to 200,000 units. Between October 8 and 18 about 40,000 units in a solution of 100 units per cubic centimeter of saline solution was injected deep into the anterior sinus (5 cc. every three hours).

The results of all this treatment were disappointing. Drainage was not lessened, sinuses did not close, and cultures remained positive.

In this case low grade staphylococcal sepsis and multiple osteomyelitic sinuses with thick walls failed to respond to penicillin therapy. It is possible that larger doses over a longer period would accomplish more, and further intensive therapy is planned in connection with an operation for removal of a sequestrum. At best, however, the problem is much more difficult than in the type presented in case 5. In another case an acute staphylococcal abscess of an arm, which was opened and drained, cleared up, while a chronic sinusitis of the leg was not affected. Undoubtedly surgical cleaning out of necrotic bone helps greatly to render the organisms accessible to penicillin. This is illustrated further in the following case:

CASE 7.—A woman aged 32 had had chronic sinusitis involving the frontal and maxillary sinuses for at least four years. Four weeks before entry the right antrum was drained, and one week later swelling and tenderness of the overlying tissues developed. Seven days' administration of sulfonamide compounds did not help. On examination the right side of the face was swollen so that the eye was nearly closed and the nasolabial fold obliterated. The skin was red and shiny and very tender on pressure. There was a draining sinus above the alveolar process over the canine tooth on the right. Thick yellow pus came from this area. The alveolar process seemed to be loose. The diagnosis was osteomyelitis of the right maxilla. Culture showed a variety of bacteria including a heavy growth of *Staph. aureus* (coagulase positive). There were swings of the temperature up to 39.5 C. (103.1 F.).

Otolaryngologists as consultants pointed out that in their experience bone infections of this sort always progress to a fatal issue. Between September 25 and October 31 the patient received 2,690,000 units of penicillin by intravenous and subcutaneous drip in doses of 45,000 to 200,000 units daily. Two operations were performed for the removal of necrotic pieces of bone. Her disease ran a stormy course with several exacerbations, but by November 1 the temperature was normal. It has now remained normal for twelve days, she feels well, all drains are removed and the sinuses are closing.

The importance of a combination of surgical drainage and removal of dead bone with the continuous injection of penicillin is to be emphasized. In spite of the treatment with penicillin this patient continued to have exacerbations until such surgical measures had been instituted. On the other hand, it is said that surgical treatment alone never arrests the relentless progress of osteomyelitis in patients with involvement of bones of the face of this type.

SYPHILIS

The rapid disappearance of *Treponema pallidum* from surface lesions and the resolution of early lesions under penicillin therapy have recently been reported.⁹

These observations we have confirmed without exception in a series of 7 cases of early (seronegative and seropositive) syphilis. A typical example is as follows:

CASE 8.—A young Negro noticed a penile lesion fourteen days and swollen glands in the groins two days before entering the hospital. He had a typical chancre, 1.2 cm. in diameter, and large inguinal lymph nodes. The Wassermann reaction was negative, but huge numbers of typical, actively motile treponemes were seen in dark field preparations from the primary lesion. He received 200,000 units of penicillin by intravenous drip daily for five days—a total of 1,000,000 units. Twelve hours after the start of treatment only a rare treponeme was seen; two hours later none were found. There was rapid involution of the chancre and nodes over a period of ten days.

In other cases condylomas have become free of treponemes in approximately twelve to twenty hours. In 1 patient with an extensive but pale roseola there was a violent flare-up of all the lesions within a few hours after the infusion of penicillin was started, a phenomenon probably analogous to the Herxheimer reaction. The lesions became bright red and palpable. This was followed by rapid clearing.

It seems clear then that immediate results comparable to those obtained with full doses of arsphenamine can be achieved. However, this by no means indicates that treponemes have been completely destroyed throughout the body and that recurrences, perhaps resembling those seen in patients inadequately treated with arsphenamine, will not take place later. The most careful observation and control of penicillin treated patients are necessary for a long period before any conclusion can be drawn as to the ultimate effect. Quantitative serologic tests at frequent intervals, thorough physical examination and later examination of the spinal fluid must all be done over a period of years to determine the final results. Dosage also has so far been purely tentative. It is clear, then, promising as these immediate results in syphilis seem to be, that the use of penicillin should still be restricted to the most careful experimental study of selected cases. The whole matter of penicillin treatment for syphilis is now being supervised by committees of the National Research Council and by the Committee on Medical Research of the Office of Scientific Research and Development.

COMMENT AND SUMMARY

These experiences with penicillin therapy serve largely to emphasize the unsolved problems. The best route of administration and the optimum dosage of penicillin for various infections are as yet unsettled. Formulation of a sort is however possible. It is established that gonococcal infections can usually be cured in a day or so by a total dose of 60,000 to 100,000 units given by intravenous drip, by subcutaneous clysis or by divided intramuscular injection. Staphylococcal infections, on the other hand, are much more stubborn and even in favorable cases days or weeks elapse before cure is effected. It is our impression that a much higher dose of penicillin (200,000 to 400,000 units per day) should be given in the early stages of severe staphylococcal infection and that the dose should never be under 120,000 units for an adult of average size. Continuous intravenous drip has been successful in our hands in staphylococcal infections whereas subcutaneous clysis is likely to be ineffective because of the lower blood levels obtained by this method, although the last word on the subject is not yet said. Intermittent intramuscular injections seem to us a less satisfactory method of treating severe staphylococcal sepsis.

9. Mahoney, J. F.: Paper read before the American Public Health Association.

but our experience is mainly with intravenous administration. In any event, in every case the dose of penicillin and the route of administration should be carefully planned each day. One is guided by the clinical situation, the bacteriologic findings and the measurements of the blood level of penicillin. These principles apply to any infection for which penicillin is used.

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ANTIMICROBIAL AGENTS OF BIOLOGIC ORIGIN

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From the point of view of chemotherapy knowledge of the origin of an antimicrobial agent is less important than an understanding of its nature and of its chemical and biologic properties. Quinine and penicillin are obtained today from biologic sources; tomorrow they may be synthesized in the chemical laboratory; but whatever their mode of production, the student of infectious diseases will remain primarily concerned with their specificity for certain strains and stages of parasites, the mechanism of their action on the susceptible cells and their physiologic and pathologic effects on the host.

During the past few years great and perhaps excessive emphasis has been placed on micro-organisms as sources of antimicrobial agents. It must be kept in mind, however, that the production of these agents is not an exclusive attribute of micro-organisms but is widely distributed in the plant and animal kingdom.¹ Suffice it to mention that among plant products quinine, emetine, chaulmoogra oil and many other substances were used in therapy long before the bacteriologic era and have, in fact, remained the best chemotherapeutic agents available for certain specific purposes. From animal tissues and body fluids there have been separated a great variety of products which possess interesting antibacterial properties. One of these, lactenin, has been obtained from milk in the albumin fraction; it appears to be a protein and exhibits great activity against streptococci;² another substance, lysozyme, which will be mentioned again later in this report, causes the lysis of several bacterial species;³ histones and protamines have also been recently shown to possess antibacterial properties.⁴ Lactenin and lysozyme have not yet found application in the treatment of infectious diseases but they may be of significance in preventing certain types of infections, as will be pointed out later.

The number and the variety of antimicrobial agents produced by unrelated strains of micro-organisms are illustrated by a recent review which lists 373 references dealing with this subject.⁵ These microbial products include simple organic molecules like hydrogen peroxide, pigments like pyocyanine (α -oxyphenazine), many phenols and quinones, complex organic substances like penicillin, polypeptides like gramicidin and tyrocidine, and protein enzymes like penatin.

Although many of these substances of biologic origin exhibit great antiseptic activity *in vitro*, only a few retain this property in the presence of animal tissues; in this respect antiseptics of biologic origin present the same problem as chemical antiseptics. Of the countless antimicrobial substances produced by chemical methods (heavy metals, halogen derivatives and other oxidizing agents, phenolic substances, dyes, aromatic oils, soaps and detergents, and others) only a limited number, such as some arsenicals and the sulfonamides, can be classified as chemotherapeutic agents. It would be of the greatest theoretical and practical interest, therefore, to understand the nature of that property or combination of properties which permits an antimicrobial agent—be it of chemical or of biologic origin—to retain its activity *in vivo*. Leaving out of consideration most of the factors which involve the host, one may attempt to recognize some of the properties which differentiate the ordinary antiseptics from the few substances which can be used in the therapy of infectious diseases. It may be useful, however, to begin by defining more accurately some of the phenomena by which one recognizes the antiseptic effect of a certain substance on a given microbial species.

BACTERIOSTATIC VS. BACTERICIDAL EFFECT

Antimicrobial agents are usually described as possessing a bacteriostatic or a bactericidal effect. The sulfonamides and penicillin offer perfect examples of the former type of action; even when used in concentrations greatly in excess of those sufficient to cause complete inhibition of growth they fail to cause rapid death of even the most susceptible species. Moreover, when the susceptible organisms which have been exposed to the drug are transferred to a new medium free from it, they grow as readily as untreated cells. On the other hand, phenols and actinomycin B,⁶ for instance, are typical representatives of the bactericidal group; in adequate concentrations they cause within a few minutes the death of cells exposed to their solutions. In the typical cases one can therefore differentiate without any difficulty bacteriostatic and bactericidal effects. There are many situations, however, where the differentiation is less clear. One may consider, for example, the case of a suspension of staphylococci or of anthrax spores treated with mercury bichloride; after being exposed for a few hours to the antiseptic these cells fail to grow when transferred to a new medium. If, however, the poisoned culture is treated with hydrogen sulfide, the cells recover their viability even though they have been exposed for seventy-two hours to 1 per cent mercury bichloride.⁷ A similar phenomenon is observed with a certain basic protein extracted from wheat germ which acts as a powerful antiseptic for yeast and for *Lactobacillus casei*. If after twenty-four hours' exposure of these organisms to the toxic protein one adds to the system an adequate amount of a phosphatide, the cells recover their viability and grow; it appears that in this case the wheat protein forms a lipoprotein complex with the phospholipid and is thus dissociated from the inhibited microbial cell.⁸ As a final example of reversible inhibition, one may consider the case of a gram positive organism which after treatment with gentian

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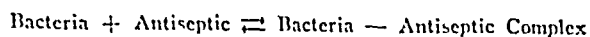
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violet appears to have lost its ability to grow; in this case again it is sufficient to add to the system the proper amount of acid—large enough to permit dissociation of the dye-bacteria complex but not too great to interfere with bacterial growth—to observe that the effect was only bacteriostatic.⁹

A statement of the problem of bacteriostatic versus bactericidal effect can be presented in the following general terms. A reversible combination takes place between some cellular constituent of the bacterial cell and the antiseptic.



The equilibrium of this reaction is conditioned not only by the nature of the microbial species and of the antiseptic involved but also by the environmental conditions under which the reaction takes place. Thus, if bacteria and antiseptic combine through their basic and acidic groups, the pH of the medium is of the greatest importance, and in fact it is known that cationic antimicrobial agents in general, and basic dyes in particular, are most active at slightly alkaline reactions, whereas the antiseptic effect of anionic detergents and dyes is enhanced in acid mediums.¹⁰ One may, on the other hand, affect the equilibrium by adding to the system a substance which possesses great affinity for the antimicrobial agent (e. g. SH-compounds for arsenicals and mercurials, phospholipids for the wheat protein) and thus help in dissociating the antiseptic-bacteria complex.

According to these views it may not be appropriate to speak of a substance as bactericidal or bacteriostatic in nature, since the outcome—bactericidal or bacteriostatic—of the reaction caused by any given agent is conditioned not only by the chemical nature of the latter but also by the nature of the micro-organism under consideration and by the environmental factors. It is obvious, however, that there are some characteristics of the antimicrobial agent which are of paramount importance in deciding its action; thus substances endowed with surface activity are likely to form with the microbial cell fairly stable complexes and therefore to behave as bactericidal agents. Moreover, the property of surface activity probably results in disruption of cell membranes and denaturation of protein enzymes, thus causing irreversible damage and death.¹¹ It is perhaps to their ability to lower surface tension that substances like the phenols, the anionic and cationic detergents, and tyrocidine owe their great bactericidal activity.^{11a}

INHIBITORS OF ANTIMICROBIAL AGENTS

It is hardly necessary to mention that the same factors which are capable of reversing the reaction between cell and antiseptic and of restoring, therefore, viability to an inhibited cell are also capable of inhibiting entirely the antiseptic effect of a given substance if added to the microbial suspension prior to the antiseptic. It is common knowledge that paraaminobenzoic acid inhibits the antibacterial effect of sulfonamides, probably by competing with the drug for some specific cellular substrate; other similar examples of competitive inhibition have been described and need not be referred to further here.^{11b} There is, however,

a type of inhibition of antimicrobial agents which is still poorly understood and deserves some mention at the present time. It has been observed that several types of phospholipids and a few other surface active substances when added to a suspension of living cells are capable of protecting them against the lethal effect of the subsequent addition of many toxic agents; it has already been seen that phospholipids can form inert complexes with certain toxic agents (wheat protein). It is likely that they can also exert a protective action by becoming adsorbed on the cell surface, perhaps at the very sites at which the toxic agents would otherwise become adsorbed;¹² this fact is of great practical importance since phospholipids are so commonly present in biologic materials. It has been found, for instance, that the presence of very small amounts of a cephalin such as phosphatidyl serine is sufficient to protect susceptible bacterial species against the action of gramicidin not only in vitro but also in vivo; in this respect it is worth pointing out that gram negative bacilli release into the mediums in which they grow certain complexes rich in phospholipids which behave as extremely active inhibitors of gramicidin; this observation probably explains the fact that in mixed cultures or mixed infections the gram negative bacilli appear to protect the otherwise susceptible gram positive organisms against the effect of gramicidin.¹³ Although penicillin is readily inactivated by chemical procedures and by certain microbial enzymes, there is as yet no record of any other biologic material capable of inhibiting its action, a fact which certainly contributes to the remarkable effectiveness of the drug in vivo.¹⁴

THE SELECTIVITY OF CHEMOTHERAPEUTIC AGENTS

The ideal chemotherapeutic agent is, of course, one which exhibits great affinity for the parasites but is completely inactive against the constituents of the tissues of the host. On the other hand, it is well known that most antimicrobial agents, whether of synthetic or of biologic origin, affect all kinds of living cells, reacting with morphologic structures or with metabolic systems common to all living matter and behaving, in other words, as general protoplasmic poisons. It is of special interest, therefore, that several of the few agents which have proved to retain their activity in vivo usually exhibit definite selectivity in their action. Thus penicillin, which is so immensely active against certain types of organisms (gram positive cocci, bacilli, gonococci, spirochetes) is only little active or inactive even in vitro against many gram negative and acid fast bacilli;¹⁵ little has been published so far as to its effect on the cells of animal tissues, but isolated reports indicate that it does not affect their growth or metabolism, a fact reflected in the remarkable lack of toxicity of penicillin. Gramicidin also exhibits great selectivity as to microbial species that it affects and in general is most active against gram positive species (gonococci and meningococci being also somewhat susceptible); gramicidin is also extremely toxic for erythrocytes and for spermatozoa but is apparently inactive against the other types of animal cells so far tested;¹⁶

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its hemolytic property is sufficient to rule out its use in the treatment of systemic infections but its lack of toxicity for other cells, especially those involved in tissue repair, may render it useful in the treatment of certain localized infections; this is illustrated by the many reports of its successful utilization in the treatment of bovine mastitis caused by streptococci¹⁷ and of infected ulcers. Even the sulfonamides are not equally active against all types of cells, and it is perhaps of some interest that among the gram negative bacilli those of the dysentery group are the ones which have proved most susceptible; interestingly enough the dysentery bacilli have been classified by some authors as "gram variable" and are in fact, by some of their properties, closer to the gram positive group than are the organisms of the colon-typhoid group.

It is obvious that many factors influence the selectivity of an antimicrobial agent: the acidic and basic properties of the cell under consideration, the nature and property of its membrane, its permeability, the relative importance for metabolism and viability of the specific biochemical systems affected by the antiseptic, the activity of the autolytic enzymes, and so on, are all attributes which bear a definite relation to susceptibility. Moreover, each one of these properties may undergo variation either independently or simultaneously and thus give rise to mutant forms of modified susceptibility. It is because so many and unrelated factors affect the outcome of the antiseptic and chemotherapeutic reaction that the receptor concept of Paul Ehrlich, although correct in its general principle, has been relatively ineffective for the analysis of the problem. Among the few generalizations which appear justified at the present time, it may be appropriate to mention that certain gram negative bacilli in their behavior toward many types of antiseptics behave much more like animal tissue cells than do other microorganisms. If confirmed, this view would provide an explanation for the fact that attempts to discover chemotherapeutic agents effective against *Salmonella* have so far presented such great difficulties.

THE EFFECT OF ANTISEPTICS AND CHEMOTHERAPEUTIC AGENTS ON CELLULAR METABOLISM

It is known that most antiseptics interrupt immediately and irreversibly the metabolism of living cells, whether it is measured in terms of oxygen consumption, production of carbon dioxide, production of acid, luminescence or some other manifestation; in fact, measurement of the inhibition of these metabolic events has often been suggested as a quantitative method of determining antiseptic action. One may consider on the other hand what little is known of the effect on metabolism of some of the few agents which have been found to retain their activity *in vivo*. There is still much argument concerning the intimate mechanism of the action of sulfonamides; it is certain, however, that these drugs do not completely or even noticeably interrupt cellular metabolism; bacterial cells inhibited in their growth continue to metabolize even in the presence of an excess of sulfanilamide.¹⁸ Although no quantitative data have yet been published concerning the effect of penicillin on the metabolism of susceptible cells, it has been clearly stated that the drug does not affect the respiration of staphylococci. The compara-

tive effect of gramicidin and tyrocidine is illuminating with reference to this problem. Both these substances are produced in cultures of *Bacillus brevis*, both are polypeptides in nature, both exhibit antibacterial activity. Tyrocidine is toxic not only for bacteria but also for all types of living cells so far tested and is therefore entirely ineffective *in vitro*; gramicidin, on the contrary, although toxic for spermatozoa and erythrocytes, is inactive against many other types of tissue cells and, among bacteria, affects chiefly the gram positive species. Interestingly enough tyrocidine, like other common antiseptics, completely and irreversibly inhibits cellular metabolism, whereas gramicidin permits maintenance—even though in a modified form—of oxygen consumption, of carbon dioxide and acid production and of several other metabolic functions of the most susceptible cells.¹⁹

It appears, therefore, that the typical antiseptic behaves as a gross protoplasmic poison, destroying the general metabolic—and especially the catabolic—cellular mechanisms. On the contrary, most chemotherapeutic agents have a very selective effect on some specific metabolic steps. The nature of the specific steps inhibited will undoubtedly vary from one chemotherapeutic agent to another. There are, for instance, observations which suggest that the primary effect of the sulfonamides is on some synthetic anabolic process.²⁰ In the case of penicillin it is reported that the drug does not in reality interrupt growth of the inhibited cell but prevents cellular division, with the frequent production of giant forms.²¹ In this case, therefore, the inhibition may affect some step of cellular division and not a catabolic process measured by respiration.

The analysis of the differential effect of common antiseptics and chemotherapeutic agents on cellular metabolism is a problem not only of theoretical interest but also of immediate practical importance. Because of the cost and the labor involved in animal experimentation, many workers have attempted to develop short cut "screening" methods for the rapid detection *in vitro* of antimicrobial agents in natural sources. All of these methods make use of inhibition of metabolism as measured by the uptake of the oxygen, production of carbon dioxide or of acid, luminescence and other manifestations. It is important to realize that, although these technics would have been successful in detecting the gross protoplasmic poisons they would probably have failed in recognizing many substances of chemotherapeutic activity; penicillin would have been neglected in favor of the countless other phenolic compounds and quinones produced by molds, actinomycetes and bacteria; tyrocidine would have been selected in preference to gramicidin; the sulfonamides would have been discarded as agents of little metabolic activity.^{21a} The need for *in vitro* screening methods in the search for new chemotherapeutic agents is evident; it is clear, however, that none of the methods available at the present time are satisfactory and that the development of new and adequate technics may have to await increased knowledge of the reactions concerned in anabolic metabolism and in the processes of growth and cellular division.

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18. Dubos, Van Niel.²⁰

the discontinuance of therapy was voluntary. Usually the patient saw no need for continuing with treatments when he was feeling well, though occasionally the family was unwilling to furnish transportation or assume the financial responsibility when he was considered ineligible for free care. The average amount of liver given

TABLE 2.—Summary of Observations

	Males	Females
Number of cases.....	25	20
Number of relapses.....	48	40
Ages.....	33 to 73 years	17 to 80 years
Race.....	Caucasian 21 Chinese 1	Caucasian 25 Negro 4
Time to relapse.....	3 to 38 months	2 to 30 months
Total relapses per patient.....	2 to 12	2 to 6
Duration of interval treatment..	½ to 37 months	½ to 45 months
Amount of liver given during interval.....	22 to 2,000 units	25 to 800 units
Red blood cell count at time of relapse.....	0.61 to 2.36 million	0.43 to 2.60 million

during the period of observation varied from 10 to 400 units per month, depending in part on the patient's needs and in part on his regularity of attendance at the outpatient clinic.

The patients who discontinued therapy returned in relapse at intervals varying from two to thirty-eight months. About 33 per cent relapsed during the first six months, 36 per cent during the next six months, 24 per cent during the second year, 5 per cent during the third year and about 1 per cent later. No arbitrary erythrocyte level was used for the criterion of relapse. In each case the relapse represented an incapacitating illness with levels so low at times as to be barely compatible with life. The highest blood level recorded during relapse was 2.60 million, while the lowest was 0.43 million.

Though multiple relapses were common, 1 case, we believe, was unique (chart 1). In an observation period of ten and one-half years this patient had twelve relapses, the last one, complicated by a fractured femur, resulting in his death.

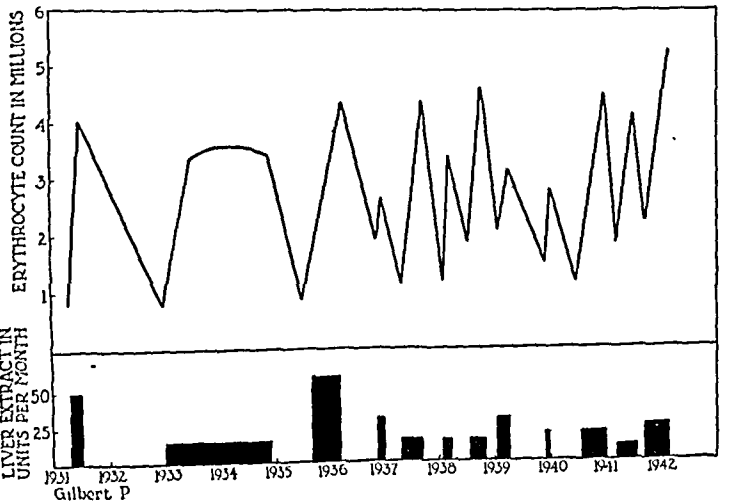


Chart 1.—Patient showing 12 relapses in ten and one-half years due to self neglect.

COMMENT

With the introduction of liver therapy⁴ the natural history of pernicious anemia was completely altered. At the time of what usually represented the first relapse an artificial remission was induced by liver, and this

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remission was maintained by the exhibition of continuous substitution therapy. Occasionally, however, a patient tiring of treatments when feeling well would abandon his treatments, only to relapse at some subsequent date. How long he would maintain himself in the interval without therapy poses a question of great practical importance. Several workers have attempted to investigate the duration of remissions in an attempt to determine what mode of administration of liver might be the method of choice. It would have great practical advantage if, for example, the "depot treatment" was practical. This subject has been investigated by Murray-Lyon,⁵ Miller,⁶ Strauss and Pohle⁷ and Askey,⁸ among others. The results of their observations were essentially similar: after the injection of a massive dose of liver extract a more or less complete remission ensues, which lasts from two to twenty-seven months before clinical or hematologic regression again manifests itself. They agree that some storage of the liver principle is possible when massive quantities are injected but that a quantitative storage is unlikely. Nor does there seem to be a relation between the liver requirement (as expressed by the average number of

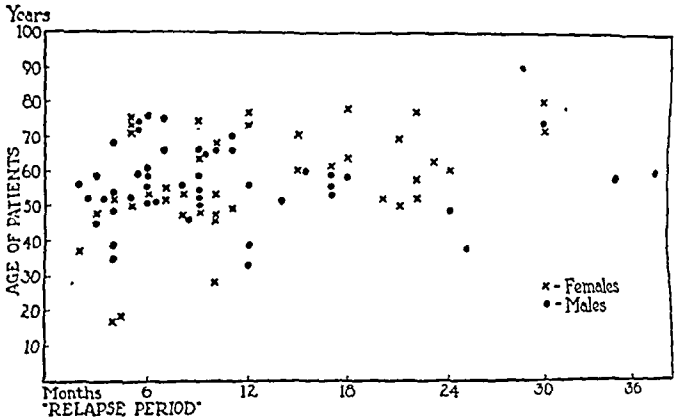


Chart 2.—Lack of correlation between age and sex and the time before relapse after discontinuance of liver therapy.

units needed for maintenance therapy) and the "relapse time" following a massive dose. Strauss and Pohle⁷ in particular, have pointed out that "patients with pernicious anemia who require relatively little liver extract to maintain a normal blood level may relapse in as short a time as two months after liver therapy is omitted."

Although we agree with the fundamentals of the foregoing statements, our observations demonstrate that no conclusions can be drawn from the experiments described, since the factor of relapse is a highly singular phenomenon, which is even remarkably inconstant in the individual patient. Moreover, the arbitrary blood levels assumed by some as representing relapse are also subject to criticism since some patients maintain themselves at suboptimal levels for long periods while others show a continuous decline at a fairly rapid rate.

The individual "relapse period" is probably intimately linked with the quantitative secretion of "intrinsic" factor,⁹ the quantity of "extrinsic" and other essential

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9. Isaacs, Raphael, and Goldhamer, S. M.: Role of Decreased Amount of Gastric Secretion in Production of Pernicious Anemia, Proc. Soc. Exper. Biol. & Med. 31: 706, 1933.

dietary factors and the storage of the "anti-pernicious anemia principle" in the liver. That this in itself is not the entire story is proved in part by the fact that no correlation is demonstrable between the "relapse time" and the average amount of liver necessary for maintenance. Some other factor, the nature of which is not at all understood, must be operating in addition. This

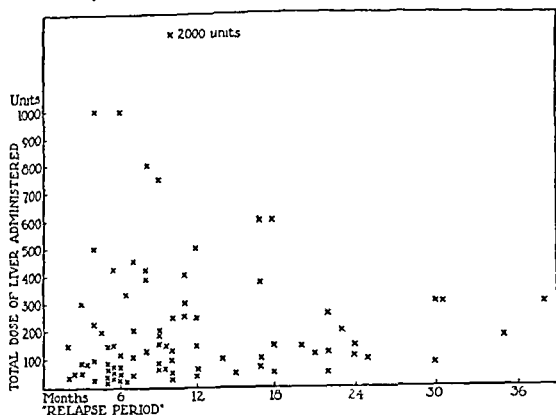


Chart 3—Absence of demonstrable relationship between total amount of liver administered and time necessary for relapse after discontinuing liver therapy

is further suggested by the spontaneous and, at least temporarily, complete remissions which have been reported even before liver therapy was discovered. It is conceivable that cyclic changes, changes whose nature or cause is as yet unelucidated, take place in the pyloric gland organ¹⁰ and account for the variability of relapses and individual liver requirement from time to time. Perhaps when these are better understood they will help solve some of the still ill understood problems associated with pernicious anemia.

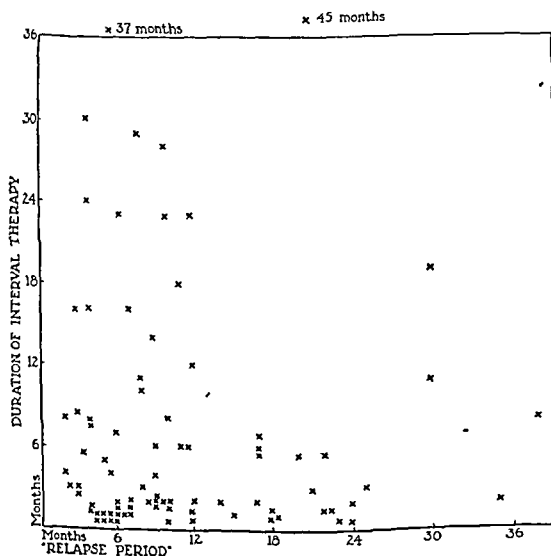


Chart 4—No difference in time before relapse as related to the length of time liver was administered before its discontinuance

Attempts to correlate other palpable factors, such as sex, age, race, total amount of liver administered, duration of treatment before discontinuance and average monthly dose, with the "relapse period" were uninformative (charts 2 to 4).

¹⁰ Meulengracht, E.: Histologic Investigation into the Pyloric Gland Organ in Pernicious Anemia, *Am J. M. Sc.* 197:201, 1939.

SUMMARY AND CONCLUSIONS

Fifty-four cases of pernicious anemia in which 88 individual secondary relapses occurred due to self neglect were observed. No correlation could be demonstrated between the age, sex, race, duration of treatment previous to abandonment of therapy, total amount of liver given or average dose and the "relapse period." It is suggested that the amount of "intrinsic factor" secreted, the diet, the storage capacity of the liver and some other as yet unknown factors influence the duration of remissions. It is felt that previous studies attempting to evaluate massive dose therapy and the storage of liver extract were inaccurate because they did not take sufficient cognizance of the highly individualized behavior of patients with pernicious anemia during remissions.

THE DIET AND CHRONIC PEPTIC ULCER

ITS RELATION TO THE COURSE OF THE
DISORDER

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PHILADELPHIA

In previous studies, lower levels of serum total protein, serum albumin and plasma ascorbic acid were found in patients with chronic peptic ulcer than in comparable persons without clinical evidence of gastrointestinal disorder.¹ Since modification of the chemical structure of blood plasma influences the clinical course of ulcer through its action on motor and secretory functions of the stomach as well as by its effect on healing of the actual ulcer, it seemed of value to determine whether these changes in the blood were an integral part of the disease complex or reflected a deficiency in the diet.

This study presents an analysis of the dietary records of 16 of the group whose blood studies have been reported. These patients, while considered representative of the group as a whole, were selected primarily because of their willingness to cooperate. Their average age was 45, the youngest 21 and the oldest 69. None had suffered any recent exacerbation of ulcer symptoms, and none had been following a prescribed dietary regimen at the time of this study. According to their own statements, no radical change in food habits had occurred during the period of ulcer symptoms; 75 per cent, however, admitted that nausea, postprandial distention or discomfort influenced the amount of food eaten. In common with the entire group under observation, these individuals were underweight. The average weight deficiency amounted to 16 per cent of the ideal weight based on height and age; 4 were less than 10 per cent underweight, 7 more than 20 per cent.

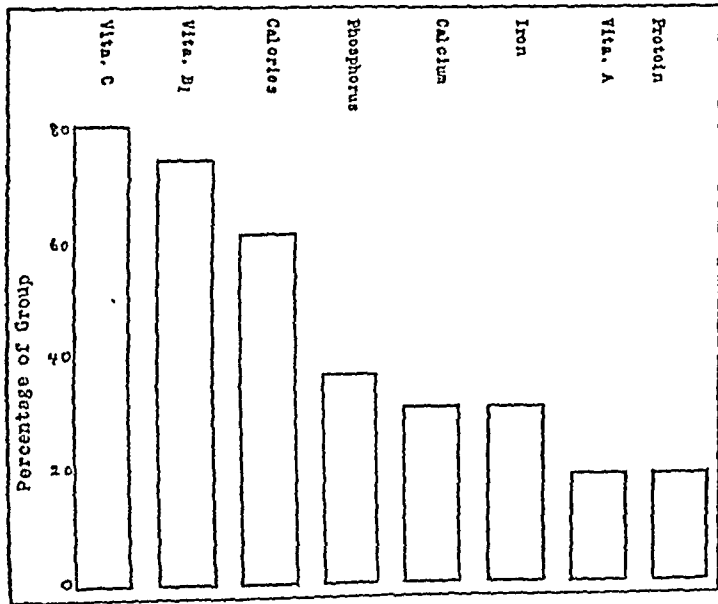
From the Laboratories and Wards of the Philadelphia General Hospital. The work was supported by a grant from John Wyeth and Brother, Inc. This is the fourth of a series of papers dealing with various aspects of peptic ulcer.

1. Riggs, H. E.; Reinhold, J. G.; Boles, R. S., and Shore, P. S.: Quantitative Circulatory Deficiencies Observed in Peptic Ulcer, *Am J. Digest Dis.* 8:383-387 (Oct.) 1941.

The patients were sent to a graduate dietitian assigned by the hospital² for instruction in compiling dietary records; later the same dietitian reviewed the completed record with the patient. The food diary covered a period of seven days, listing all food eaten during that period together with the amount. From these records the average food intake of the group as well as the nutritional value of the individual diets was computed. The daily allowances for specific nutrients recommended by the Committee on Foods and Nutrition of the National Research Council were used as standards for comparison;³ daily consumption of less than two thirds of this amount was arbitrarily considered evidence of deficiency. In calculating the vitamin content of the diet, allowance for loss during cooking was estimated by deducting 20 per cent from the vitamin C content of the raw food and 33 1/3 per cent from the vitamin B₁ value. When more than one value was recorded for vitamin content of any food, the mean of those given was used.

RESULTS

The diet of the group was found to be low in caloric value and deficient, by the criteria established, in vitamins B₁ and C, as shown in the chart. Owing to wide variations in food intake, greater nutritional deficiencies were present in individual diets than indicated by the mean. The poor caloric intake (1,718 ± 600 calories) was due largely to lack of energy producing foods in the diet. The average diet contained 70 ± 30 Gm. of fat and 205 ± 75 Gm. of carbohydrate, contributing only 1,452 ± 500 calories for energy production. The inadequacy of the diets in this respect is emphasized by comparing the value (2,220 calories) allotted to the same classes of foodstuffs in the 2,500 calory diet recommended for persons engaged in sedentary work. Seven (44 per



Nutritional deficiencies in peptic ulcer group (intake less than two-thirds recommended daily allowance).

cent) diets contained less fat than the minimum ration (57 Gm.) adopted by the Interallied Food Committee for use during World War I.⁴ Eleven (79 per cent)

diets included less than two thirds of the amount of carbohydrate customarily allotted (50 per cent total calories = 312 Gm.) to the diet of sedentary workers.

While restriction in food energy value was most outstanding, the average amount of protein (65 ± 26 Gm.) consumed was less than that recommended. Considering the low caloric value of the diets, the ratio of protein food was good (16 per cent), but on the

Diet of 16 Patients with Chronic Peptic Ulcer

	Calo- ries	Pro- tein, Gm.	Vita- min A, Units	Vita- min B ₁ , Units	Vita- min C, Mg.	Cal. cium, Gm.	Phos- phorus, Gm.	Iron, Mg.
Recommended daily intake	2,500	70	5,000	500	75	0.80	1.32	12
Diet, ulcer patients	1,718 ± 600	65 ± 26	5,800 ± 2,663	265 ± 100	34 ± 17	0.98 ± 0.7	1.21 ± 0.6	10 ± 3

basis of normal weight only five (31 per cent) diets supplied an average of 1 gram per kilogram and three (19 per cent) approached an actual deficiency level of less than 0.7 Gm. per kilogram. High value proteins—milk, eggs, lean meat—made up two thirds of the total protein, but again the actual intake (46 ± 8 Gm.) was below the amount considered adequate to maintain nitrogen equilibrium.⁵

The relatively high ratio of protein in the diet was in large measure due to heavy consumption of milk. As a result the vitamin A content (5,800 ± 2,663 international units) was above the recommended level. In three diets, however, the content of this vitamin was low enough to be considered inadequate. In contrast to vitamin A, the diet was extremely poor in thiamine and ascorbic acid. The average level of vitamin B₁ was 265 ± 100 international units, with twelve (75 per cent) diets containing less than two thirds of the amount recommended. Thirteen (81 per cent) diets showed similar deficiency in vitamin C, with the average diet containing only 34 ± 17 mg. of ascorbic acid. More than 25 per cent of the diets contained less than the estimated maintenance allowance (25-30 mg.) of this vitamin.⁶

The liberal use of milk also accounted for the high calcium (0.98 ± 0.70 mg.) and phosphorus (1.21 ± 0.60 Gm.) content of the diet: Six diets, however, contained inadequate amounts of one or both of these elements. By contrast, the average diet contained only a minimum amount of iron (10 ± 3 mg.), and 5 patients consumed diets which were definitely inadequate in this mineral.

COMMENT

Poor selection of food rather than financial restriction appeared to limit the diet of this group. Proteins, especially the costly, high value type, made up a liberal portion of the food intake. Despite its large contribution to the total caloric value, the actual amount of protein consumed was not sufficient to supply tissue requirements and to substitute for fat and carbohydrate as a source of energy. Failure to include adequate fruit and vegetables in the diet was one of the causes of its low caloric value as well as of its deficiency in vitamin C. This class of foodstuffs contributed less

2. Miss Elizabeth Miller, chief dietitian of the Philadelphia General Hospital, provided this assistance.
3. The level for phosphorus in the diet (1.32 Gm.) is that recommended by Stiebeling and Phipard.⁶
4. Wright, Samson: Applied Physiology, ed. 6, London, Oxford University Press, 1937.

5. Everett, M. R.: Medical Biochemistry, New York, Paul B. Hoeber, Inc., 1942.
6. Stiebeling, H. K., and Phipard, E. F.: Diets of Families of Employed Wage Earners and Clerical Workers in Cities, Circular 507, United States Department of Agriculture, January 1939.

than 10 per cent of the total calories and provided only 34 Gm. of carbohydrate. As a source of thiamine it contributed only 0.17 mg. (58 international units). Fruits and succulent vegetables, especially of the leafy types, rarely appeared on these diet lists. Citrus fruits or tomatoes in any form contributed only 8 mg. of ascorbic acid and were absent in over 65 per cent of the individual diets. Omission of fruit and vegetables was not entirely attributable to seasonal trends, although the records were compiled in winter and early spring. During the same period, diets of a comparable group without gastrointestinal disorder showed an ascorbic acid content of 75 ± 33 mg.

In some respects the large consumption of milk compensated for the absence of fruit and vegetables. This foodstuff provided 29 per cent of the caloric intake as well as 35 per cent of the dietary protein, 41 per cent of the vitamin A content and 31 per cent of the thiamine. Milk also added greatly to the mineral content, providing half of the phosphorus and three fourths of the calcium. Since most of the calcium (90 per cent) was obtained from sources also rich in phosphorus and little from vegetables and fruit which are relatively low in phosphorus, the normal ratio of these two minerals in the diet was reversed (0.8), with 81 per cent of the diets containing a calcium-phosphorus ratio less than 1. Under these conditions, inadequate retention of both minerals may have resulted, in spite of the liberal dietary supplies.

The deficiencies in diet brought out by these studies are an argument for relating alterations in composition of the blood to inadequate food intake. Diet, however, may not be the only factor determining the nutritional status of these persons. Alterations in digestion and absorption resulting from the gastrointestinal lesion may also influence nutrition, even with an adequate, balanced food intake, and must certainly amplify deficiencies in diet. That this factor must be considered in evaluating the nutrition of patients with chronic ulcer was demonstrated by comparing levels of blood ascorbic acid with dietary content of the same vitamin. Close correlation (coefficient of correlation = 0.8) was present in the group without gastrointestinal disorders, but no similar relationship (coefficient of correlation = 0.3) could be established for the patients with ulcer.

In addition to the physiologic effects mediated through the changes in blood composition, some of the clinical features associated with the chronic ulcer syndrome may be more closely allied to the dietary deficiencies of the patient than to the gastrointestinal lesion. Constipation may reflect the lack of bulk in the diet or, when associated with distention, the effect of thiamine lack on intestinal tonus. Thiamine deficiency, originating through the voluntary restriction of diet by patients with chronic ulcer, may defeat efforts to improve nutrition and tend to perpetuate itself by causing anorexia and nausea.

SUMMARY

The diets of 16 patients with chronic peptic ulcer were found to be poorly balanced and deficient in food energy value as well as in thiamine and ascorbic acid.

It is suggested that alterations in the composition of the blood found in these patients as well as some of the clinical symptoms may be related to the inadequate diet.

THE TREATMENT OF INTRACRANIAL INFECTIONS WITH PENICILLIN

REPORT OF THREE CASES

CAPTAIN ALBERT L. EVANS

MEDICAL CORPS, ARMY OF THE UNITED STATES

Penicillin, the powerful antibacterial agent produced by growth of the fungus *Penicillium notatum*, has been used with dramatic results in cases of infections heretofore usually fatal to man. Until the advent of the sulfonamides it was rare for persons with pneumococcal or staphylococcal meningitis to survive. Reports of such survivals have appeared in the literature more frequently since these agents have been used, but penicillin seems to offer more hope for cure of these maladies than any other substance known at the present time. Two cases of staphylococcal meningitis and 1 case of pneumococcal meningitis are herewith reported as having been cured with penicillin at Lawson General Hospital. It is felt that survival would not have occurred with the types of therapy in practice prior to the advent of penicillin.

REPORT OF CASES

CASE 1.—*Pneumococcal (type 18) meningitis.* A white man aged 35, admitted to the hospital on Aug. 22, 1943, had sustained a compound fracture of the skull, left frontal area and cribriform plate on July 8, when a swamp glider overturned and the propeller struck his head. He was admitted to his station hospital in an unconscious state. The wound was debrided. He was treated for fracture of the skull and cerebral contusion and was hospitalized for a month. It was noted that he had a cerebrospinal fluid rhinorrhea. He was transferred to his quarters on August 10, and the rhinorrhea stopped on his twelfth day in quarters, August 21. Severe headache, nausea, vomiting and typical signs of a virulent meningitis then developed. He was flown to Lawson General Hospital and admitted three days after the onset of signs of meningitis. X-ray examination of the skull revealed a subdural pneumocephalus of the left frontal area. Examination of the spinal fluid revealed the offending organism to be a type 18 pneumococcus. This apparently had invaded the meninges through the fracture of the frontal sinus and cribriform plate. Pneumococci were so numerous in the spinal fluid that the organisms could be seen while one was counting the cells. He was given an initial dose of penicillin of 30,000 units intravenously, followed by 5,000 units intravenously at thirty minute intervals for eight doses. He was then given 20,000 units intramuscularly every three hours for ten days. This was supplemented by intrathecal administration of 5,000 units every twenty-four hours for twelve days. The first five injections were made into the cisterna magna and the injections thereafter into the dural sac at the third lumbar interspace. An immediate response was obtained in the culture of the spinal fluid as well as in the cell count, and after twenty-four hours culture and smear were negative. At no time was there evidence of additional irritation to the cord or meninges following the intrathecal use of penicillin. On the fifth day of treatment the patient became dull and lethargic. Another roentgenogram of his skull was made, which showed a fluid level in the pneumocephalus of the frontal region. A burr hole craniotomy was performed and the air removed. Pus was not found in this region, but 5,000 units of penicillin was inserted directly into the cavity at the time of operation. The patient was supported with blood transfusions and his fluid balance maintained with intravenous fluids. His improvement was progressive, and he made an uneventful recovery, with no demonstrable residuals at the present time. He received a total of 2,085,000 units of penicillin.

It may be added that this patient received 6 Gm. of sulfathiazole by mouth at his station hospital and 12.5 Gm. of

sodium sulfadiazine intravenously at Lawson General Hospital prior to the institution of penicillin therapy. The fact that a profuse growth of pneumococci was still present suggests resistance of the organisms to the sulfonamides.

CASE 2.—Abscess of the brain with meningitis. A white man aged 22, admitted to the hospital on June 24, 1943, had had an infection of the upper respiratory tract for four days. Three days before his admission he had fallen from his bed, striking his forehead. He had not been unconscious, but he complained of severe headache and pronounced nasal congestion. Examination by the otorhinolaryngologist revealed considerable pus coming from the right middle meatus. The right eye became noticeably swollen and there was tenderness over the right frontal sinus. X-ray examination showed no evidence of fracture of the right frontal bone. The patient appeared to be acutely ill. His temperature was 103.6 F. A diagnosis of frontal sinusitis was made, and use of sulfadiazine was started. On the following day stiffness of the neck and pain on flexion were first noted and meningitis was suspected. A lumbar puncture was done, which showed an initial pressure of 275 mm. of water. The fluid was clear but contained 52 cells, of which 75 per cent were polymorphonuclear leukocytes. No organisms were found on smear or by culture. The possibility of an infection of the blood stream and a thrombophlebitis of the ophthalmic vein was considered. The blood sulfadiazine level of 7.7 mm. was felt to be inadequate, and the dosage was increased. The disease ran an afebrile course, and the patient's general condition improved, as did the swelling about the eye.

On July 5 a spinal tap was performed and 15 cc. of clear fluid was removed. The initial pressure was then 170 mm. of water. Examination of the fluid showed 5 cells, 3 of which were polymorphonuclear leukocytes. The temperature later became elevated, and at noon the next day the patient was disoriented but not comatose. He had a weakness of the left side of the face and weakness of the entire left side of a minimal degree. A diagnosis of abscess of the brain in the region of the right frontal lobe was made. With the area under procaine hydrochloride anesthesia a burr hole was made in the right frontal region. The brain was found to be under considerable tension. A needle directed toward the frontal horn of the ventricle encountered a mixture of ventricular fluid and pus. A small amount of air was allowed to enter the needle. Two cc. of iodized poppy seed oil was injected to outline the limits of the cavity. Roentgenograms made after this procedure revealed that the abscess cavity had ruptured into the ventricle. Progressive signs of meningitis rapidly developed. The ventricle was tapped daily through the burr hole and found on each occasion to contain a seropurulent fluid from which *Staphylococcus aureus* was grown. By the fifth postoperative day the fluid was less turbid, and aspiration was stopped on the seventh postoperative day. By July 24 the stiffness of the neck had almost subsided, the temperature and pulse had returned to normal and there was relatively little difference in the strength of the upper extremities. By July 29 the rigidity of the neck and spine had entirely disappeared. On August 4 because of nausea and vomiting, the use of sulfadiazine was discontinued. The course was uneventful for approximately one month, but on the morning of September 5 the patient complained of vertigo and drowsiness, symptoms which became more severe. On September 8 a ventriculogram was made; it gave evidence of a mass in the right frontal region. A right craniotomy was performed. An abscess was evacuated and a catheter inserted into the cavity. Through this catheter penicillin was administered daily for seven days. Penicillin was also administered systemically—an initial dose of 30,000 units intravenously followed by 5,000 units intravenously every thirty minutes for six doses. He was then given intramuscular injections of 20,000 units every three hours. His condition initially improved, but on the fourth day of treatment clinical signs of meningitis developed. Lumbar puncture revealed a grossly turbid fluid with 4,100 leukocytes, 95 per cent of which were polymorphonuclears. Intrathecal administration of 5,000 units of penicillin by the lumbar route was instituted, and injections were repeated every twenty-four hours for nine days. Repeated cultures and smears of the spinal

fluid failed to reveal organisms. It is felt that since the patient had received 420,200 units of penicillin prior to the appearance of meningeal signs the exudate had been sterilized of *Staph. aureus*, which caused a nonspecific meningitis. Penicillin therapy was maintained for twelve days, during which time he received 1,793,700 units. He made a progressive and uneventful recovery and was discharged on November 20 after six weeks' observation showed no evidence of recurrence of infection or neurologic residuals.

CASE 3.—Staphylococcal meningitis. A white man aged 26, admitted to the hospital on Aug. 31, 1943, had experienced intermittent dull pain and slight stiffness of the cervical region since January 1941, when he sustained an injury to his neck while playing basketball. In March 1943 he first noticed lameness of the right lower extremity on saluting and shaving. In June 1943 muscular twitchings of the right extremities accompanied by some paresthesia developed. He was unable to perform rapid movements with the right arm or leg. He was admitted to the hospital, where examination revealed weakness of all muscles of the right upper extremity and of the right hamstring group. Reflexes were exaggerated bilaterally but more so on the right side. Spinal puncture revealed a pronounced increase in protein (2,680 mg. per hundred cubic centimeters), and a Queckenstedt test gave evidence of a fluid block. He was transferred to Lawson General Hospital, where on September 6 a pantopaque myelogram of the cervical region showed a definite space-displacing mass in the cervical region. On September 7 a cervical laminectomy was performed, and a large tumor was located, extending from the foramen magnum down to the sixth cervical vertebra and possibly further. It filled the entire canal and appeared to be intramedullary. The greater portion seemed to be to the right of the midline, and its appearance suggested a hemangioma. The immediate post-operative course was uneventful. A total dose of 2,000 roentgens was given over a period of ten days. The patient made clinical improvement. On October 1 a cystic swelling was noted at the operative site, and 30 cc. of bloody spinal fluid, from which *Staphylococcus albus* was cultured, was aspirated from this area. On October 7 clinical signs of meningitis developed, and the patient rapidly became acutely ill. Penicillin therapy was instituted with injection of 20,000 units intramuscularly every three hours. Twenty thousand units was injected into the cervical region. The following day the dosage of penicillin was increased to 25,000 units intramuscularly every three hours. Daily cervical and lumbar injections of 5,000 units were administered for four days. Because of block in spinal canal there was little absorption of the penicillin in the lumbar region, and the yellow pigment of the drug was seen at each puncture. The fluid from both areas was bacteriologically negative after twenty-four hours of penicillin therapy, but the leukocyte count remained elevated for eight days. The patient made definite improvement, but because of his poor condition it was decided to aspirate as much of the fluid as possible through the cervical region and replace it with penicillin solution (500 units per cubic centimeter). Therefore 25,000 units penicillin was introduced after the aspiration of 100 to 150 cc. of fluid, without ill effect, for six days. He made progressive improvement. Treatment was continued for ten days, during which time he received a total of 1,470,000 units. The spinal fluid was clear and the cultures negative. He has shown no evidence of recurrence of meningitis.

COMMENT

Rammelkamp and Keefer¹ have shown that penicillin is not detectable in the spinal fluid after systemic administration. Pilcher and Meacham² showed that for experimental animals intrathecal penicillin therapy was of value in the treatment of staphylococcal meningitis but intravenous therapy was of little if any benefit.

1. Rammelkamp, C. H. and Keefer, C. S.: The Absorption, Excretion and Distribution of Penicillin, *J. Clin. Investigation* 22: 425 (May) 1943.
2. Pilcher, Cobb, and Meacham, William F.: The Chemotherapy of Intracranial Infections: III. The Treatment of Experimental Staphylococcal Meningitis with Intrathecal Administration of Penicillin, *J. A. M. A.* 123: 330 (Oct. 9) 1943.

The patients at Lawson General Hospital were so seriously ill that penicillin was given both intrathecally and systemically in order to give them the benefit of all forms of therapy.

Intrathecal use of penicillin in large concentrations has been shown by Rammelkamp and Keefer³ to produce a pleocytosis in the cerebrospinal fluid but no other significant toxic effect in man. This has been verified in experimental animals by Pilcher and Meacham.² It is interesting to note that in case 3 25,000 units was administered by the intrathecal route without producing a pleocytosis or other toxic manifestations. The cell count of the spinal fluid became progressively lower, even with concentrations of 25,000 units at twenty-four hour intervals.

SUMMARY

1. In 3 cases of meningitis, 2 staphylococcic and 1 pneumococcic, cures were obtained, for which penicillin is given the major credit.
2. Intrathecal administration of penicillin in cases of meningitis is thought to be of great value.
3. Penicillin is a valuable addition to the medical armamentarium for the treatment of intracranial infections due to the staphylococci and pneumococci.

Clinical Notes, Suggestions and New Instruments

AMEBIC ABSCESS OF THE LIVER WITH SECONDARY INFECTION

LOCAL TREATMENT WITH PENICILLIN

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DETROIT

Amebic abscesses of the liver may be divided into two groups from the standpoints of therapy and prognosis. The first group is composed of those without secondary bacterial infection. The accepted method of therapy in this group is the administration of emetine hydrochloride, usually combined with aspiration of the abscess. Open drainage is contraindicated, since it causes a higher fatality rate, chiefly because of the unavoidable postoperative bacterial invasion of the abscess. In a collected series of 5,000 cases, Ochsner and DeBakey¹ report a fatality rate of 5.6 per cent for the cases treated by the closed method and 43.1 per cent for the cases treated by open drainage.

The second group consists of amebic abscesses which have become secondarily infected with bacteria of various types. In these cases the prognosis is much worse, and the accepted surgical treatment is essentially the same as for other pyogenic hepatic abscesses, namely open drainage performed preferably through an extraserosus approach. Because of the higher fatality rates associated with open drainage, it has been suggested that some of these infected abscesses might possibly respond to aspiration combined with sulfonamide therapy. Alport and Ghalioungui² report a case of what was presumably an amebic abscess of the liver secondarily infected by *Bacillus pyocyaneus* in which recovery followed repeated aspirations and the local and systemic use of some of the earlier sulfonamide compounds.

3. Rammelkamp, C. H., and Keefer, C. S.: The Absorption, Excretion and Toxicity of Penicillin Administered by Intrathecal Injection, *Am. J. M. Sc.* 205: 342 (March) 1943.

From the Departments of Medicine and Surgery of Wayne University College of Medicine and City of Detroit Receiving Hospital.

1. Ochsner, A., and DeBakey, M.: Amebic Hepatitis and Hepatic Abscess, *Surgery* 13: 460-493 (March); 612-649 (April) 1943.

2. Alport, A. C., and Ghalioungui, P.: Conservative Treatment of Liver Abscesses, *Lancet* 2: 1062-1065 (Nov. 18) 1939.

The chief point of interest in the present case is the use of penicillin injected into the cavity of an amebic abscess of the liver secondarily infected with beta-hemolytic streptococci of Lancefield group G.

REPORT OF CASE

History.—A Negro aged 41 was admitted to Detroit Receiving Hospital on April 22, 1943 complaining of sharp interscapular pain of twenty-four hours' duration.

The patient had been in good health until the first week of December 1942, when he contracted a "head cold." About one week later he began to cough and noticed a sharp stabbing pain in the lower right side of his chest. He consulted a physician, who told him that he had pleurisy and advised him to stay in bed. The pain became less sharp but persisted as a steady dull ache, which extended downward over the right upper abdominal quadrant. The cough also persisted and was productive of white odorless sputum. During the succeeding months the patient remained ill, confined to his home, and spent most of the time in bed. There was a gradual loss of 18 to 20 pounds (8 to 9 Kg.), mild anorexia, gaseousness and infrequent periods of slight diarrhea alternating with constipation. His general condition improved somewhat by the first of April, and he considered returning to work. His physician advised him, however, to remain at home. About April 15 he began to have night sweats but was unaware of fever or chills. On April 21 a sharp stabbing pain developed in the interscapular area. It was intensified by muscular movements but was not influenced by respiration.

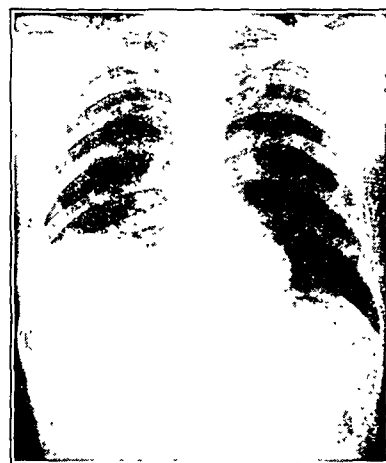


Fig. 1.—Appearance of the chest on Dec. 10, 1938. Note the elevation of the right side of the diaphragm. Compare with figure 2 A.

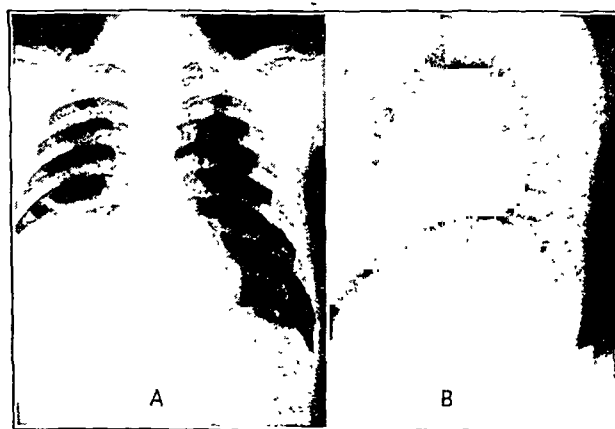


Fig. 2.—Appearance of the chest on May 15, 1943. A, anteroposterior and B, lateral views showing elevation of the right side of the diaphragm.

His general health had been good. In 1921 he noticed a sore on his penis but received no treatment for it. In 1926 he was treated for gonorrhea.

In 1938 he was sent to Parkside Hospital in Detroit because his physician suspected that he was suffering from pneumonia. Review of the hospital records reveals that he complained chiefly of pain in his back and in the right side of his chest and abdomen. He had no cough, and the pain in his chest was not pleuritic in type. There were no gastrointestinal

complaints. Physical examination of the chest showed only an elevation of the right side of the diaphragm. Except for slight tenderness in the right lumbar region, there were no abnormal abdominal findings. The Kahn reaction of the blood was strongly positive. A roentgenogram of the chest (fig. 1) showed the lungs to be clear, but the dome of the right side of the diaphragm was at the level of the fourth interspace anteriorly. There were no clinical or roentgen findings of atelectasis. The patient's temperature ranged between 98 and

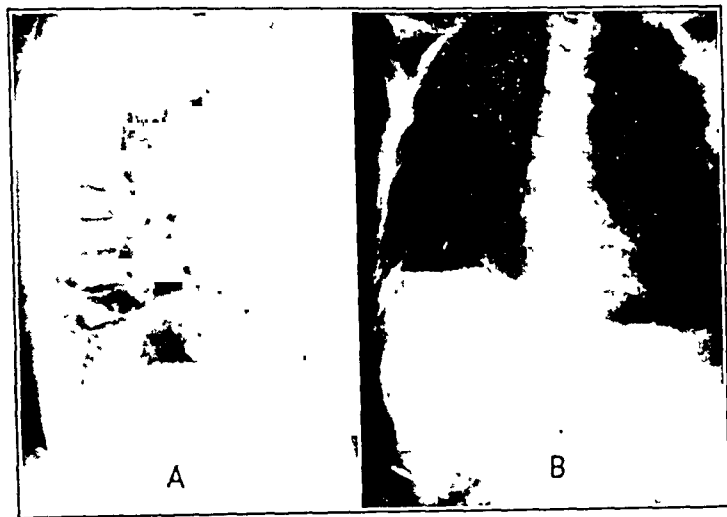


Fig. 3.—A, lateral view on May 22, 1943, showing the elevated diaphragm and the abscess cavity in the liver. B, anteroposterior view on June 4, showing the ureteral catheter coiled within the abscess cavity.

103 F. during the first eight days, then diminished, and was normal after the twelfth day. The tentative diagnosis was syphilis of the liver. The patient received several injections of a bismuth compound but did not recall having taken any antisyphilitic treatment after leaving the hospital.

In 1940 he was caught between a truck and a coal conveyor and was told that he had sustained an injury of the liver. He was brought to Redford Receiving Hospital, where he remained only overnight. A roentgenogram of the chest showed no fractures of the ribs and the diaphragm in a normal position. His past history by systems was essentially negative except for a three day period of diarrhea in 1939, which he attributed to food eaten in a restaurant. His bowel habits had been normal between that time and the present illness.

The occupational, marital and family histories were noncontributory.

Physical Examination.—The patient was well developed but poorly nourished, was 5 feet 7 inches (170 cm.) in height and weighed 110 pounds (50 Kg.). He appeared chronically ill. His mental state was clear. Examination of the skin, head, eyes, ears, nose, mouth, and throat was essentially negative. There was no cervical or other lymphadenopathy. The thyroid gland was of normal size, and the trachea was in the midline. There were some bulging and lag in expansion of the right lower posterior portion of the thorax but only slight tenderness on compression. Percussion revealed dullness shading into flatness below the 6th rib posteriorly on the right, in the axilla and below the 4th rib in the midclavicular line. Movements of both sides of the diaphragm were normal as determined by percussion. The breath sounds were absent in the area of impaired resonance and bronchovesicular over a strip just above this. There were occasional crepitant rales. The left lung was clear. The cardiac apical impulse was located in the fifth intercostal space 9 cm. to the left of the midsternal line. Percussion borders were normal. There were no murmurs. The blood pressure was 115/85. Examination of the abdomen revealed tenderness and voluntary muscular rigidity in the right upper quadrant, with an ill defined underlying mass. Evidences of ascites were absent. Rectal examination showed no abnormalities other than a slight enlargement of the prostate gland. The genitalia and the extremities showed nothing remarkable.

Initial Laboratory Studies.—Urinalysis revealed a specific gravity of 1.018, a trace of albumin, no sugar, and 75 leuko-

cytes in each high power field of the centrifuged specimen. The blood contained 3.64 million erythrocytes, and the value for hemoglobin was 5.7 Gm. There were 23,100 leukocytes with the following differential count: neutrophils 74 per cent, of which 46 were filamented and 28 nonfilamented forms; lymphocytes 24 per cent; monocytes 2 per cent. The icterus index was 5.0 and the blood urea 26 mg. per hundred cubic centimeters. The Kline reaction of the blood was negative, as was the blood culture. The value for serum albumin was 2.2 Gm. and that for serum globulin 5.1 Gm. per hundred cubic centimeters. Ingestion of 6.0 Gm. of sodium benzoate resulted in the excretion of only 0.72 Gm. of hippuric acid (expressed as sodium benzoate) in the urine during a period of four hours. The stool was described as soft and brown and gave a strongly positive reaction for occult blood. The sputum contained no tubercle bacilli on repeated tests.

Clinical Course.—During the first three weeks the patient's temperature varied between 99 and 101 F., with a corresponding elevation in pulse rate. He did not appear acutely ill. However, diarrhea became more pronounced than at any previous time, consisting of two to four soft, unformed, brown stools daily. The abdominal tenderness gradually subsided, and the edge of the liver could be defined about 10 centimeters below the right costal margin. Roentgenograms showed elevation of the right side of the diaphragm (fig. 2A and B). Fluoroscopy revealed normal motion of both sides of the diaphragm.

The combined physical and roentgen findings suggested the diagnosis of hepatic abscess. Stool examinations for parasites were ordered because amebiasis was suspected. After three negative tests, trophozoites of *Endamoeba histolytica* were found on May 12 and again on May 13. On the latter date and for the ten following days 1 grain (0.06 Gm.) of emetine hydrochloride was injected subcutaneously each day. Additional treatment for the severe diffuse hepatic damage included a diet high in carbohydrate and protein and low in fat and containing generous amounts of brewers' yeast, thiamine hydrochloride, nicotinic acid, halibut liver oil and ascorbic acid. The patient was also given intravenous infusions of dextrose. After three days of this therapy the diarrhea stopped and the thoracic pain disappeared. The patient's temperature decreased to between 99 and 100 F. and his appetite improved. However, serial roentgenograms showed no change in the size of the liver, and the hippuric acid test on May 18 was unchanged.

On May 22 the abscess was aspirated. Procaine hydrochloride was injected into the skin and subcutaneous tissues at the right costal margin in the midclavicular line. A small incision was made in the skin and a 13 gage needle inserted. It was directed upward and posteriorly for a distance of about 4 inches. At this point considerable resistance was encountered. Additional pressure, however, sufficed to force the needle into the abscess cavity, from



Fig. 4.—Appearance of the chest on September 13, showing the return of the right side of the diaphragm to its normal position.

which 350 cc. of thick gray pus was obtained. Smears showed no amebas but many leukocytes and streptococci, both graded quantitatively as 4+. When grown on blood agar the streptococcus exhibited beta hemolysis. Serologic grouping³ revealed that it belonged to group G of Lancefield. Figure 3A is a lateral view taken just after aspiration of the abscess cavity.

3. The serologic grouping of the hemolytic streptococcus was done by Miss Miriam Miller under the direction of Dr. Ivan C. Hall in the Central Laboratory of the Contaminated Wound Project of the Subcommittee on Surgical Infections of the National Research Council, financed by a contract between the Office of Scientific Research and Development and Columbia University.

Because of the evidence of pronounced hepatic damage which would have made open drainage most hazardous, we decided to inject penicillin⁴ into the cavity of the abscess. To accomplish this a 13 gage needle was reinserted and a small ureteral catheter passed through the needle. Then the needle was withdrawn and the catheter left in place. A roentgenogram was taken to check the position of the catheter (fig. 3B). Five cc. of isotonic solution of sodium chloride, each containing 5,000 Oxford units of penicillin, was injected into the abscess on the evening of May 22. This process was repeated every four hours until eight doses had been given. The amount of penicillin was then reduced to 10,000 units every four hours. This schedule was maintained for seven days, when the dose was further decreased to 5,000 units every four hours. Seven days later, on June 9, penicillin treatment was stopped. The patient received a total of 830,000 Oxford units during a period of fifteen and one-half days.

On May 25, three days after penicillin was started, a smear of the aspirated material showed leukocytes graded as 4+ but no organisms. Cultures yielded no growth. Subsequent cultures on May 27, May 28, June 2 and June 4 were likewise sterile.

Following aspiration of the abscess and treatment with penicillin the patient became afebrile and asymptomatic. On May 27 the value for the hippuric acid test increased slightly to 0.976 Gm., and the levels for serum albumin and globulin increased to 2.8 and 5.46 Gm. per hundred cubic centimeters respectively. The liver gradually decreased in size, as noted on roentgenographic and physical examination. Except to obtain small amounts of pus for cultures, no further aspirations of the abscess were necessary. Motile amebas reappeared in the stools on July 1. Accordingly, 1 grain of emetine hydrochloride was again given subcutaneously each day for five days and was followed by the oral administration of 12 grains (0.8 Gm.) of chiniofon three times daily for twelve days. At the end of this therapy no amebas were found in the stools, but another specimen on July 22 contained an occasional cyst. Sigmoidoscopy revealed no ulceration of the rectum or of the sigmoid portion of the colon. About this time also the level of serum albumin had increased to 3.5 Gm., while that of globulin had decreased to 3.7 Gm. The value for the hippuric acid test had increased to 1.3 Gm., the erythrocytes to 4,190,000 and the hemoglobin to 10.5 Gm. The patient had gained 29 pounds (13 Kg.).

He was discharged from the hospital on July 26 and has been followed in the outpatient department. He has continued on his diet with its vitamin supplements and recently has been taking viofilm. On September 15 examination of the chest was entirely negative, but the edge of the liver, which felt slightly firm, was palpable 5 cm. below the right costal margin. The spleen was not palpable. The value for the hippuric acid test had dropped to 0.707 Gm. The serum albumin and globulin levels were each 3.7 Gm., and the bromsulphalein test following intravenous injection of 5 mg. of the dye for each kilogram of body weight showed 60 per cent retention at 5 minutes, a trace at ½ hour and no retention at 60 minutes. Antero-posterior and lateral roentgenograms of the chest were within normal limits (fig. 4).

COMMENT

This case illustrates the value of roentgenography in the diagnosis of amebic abscess of the liver. The patient's chief complaints were related to the thorax, and the history of occasional periods of diarrhea was obtained only after repeated questionings. The physical findings on admission were equivocal, and if it had not been for the roentgenogram which clearly localized the disease of the liver there might have been delay in arriving at the correct diagnosis. The roentgenograms (fig. 2A and B) are very similar to those published by Ochsner and DeBailey¹ except that in our case the typical obliteration

of the anterior costophrenic angle was absent. Furthermore, the diaphragmatic movements as observed fluoroscopically were not noticeably decreased. The latter finding seemed to favor the diagnosis of hepatic abscess rather than an abscess in the subdiaphragmatic space, which would certainly have immobilized the diaphragm. However, it is reported that diaphragmatic movement is frequently impaired in amebic abscesses of the liver. It is noteworthy that in Ochsner and DeBailey's¹ cases a correct roentgenographic diagnosis was made in 88 per cent.

Another remarkable feature of this case is the clinical and roentgenographic evidence that, in all probability, an amebic infection of the liver was present in December 1938, four years preceding the onset of the symptoms of the present illness. This process, whether a diffuse amebic hepatitis or an actual amebic abscess, had at least partially subsided, as shown by the normal position of the diaphragm in the roentgenogram taken in 1940. If this was the actual course of events, the duration of the disease was unusually long, for among 113 cases classified by Ochsner and DeBailey as chronic amebic abscesses the average duration of symptoms was three to six months and the longest duration three years.

The final point of interest is the consideration of the value of penicillin therapy in this case and its possible value in other cases of secondarily infected amebic abscesses of the liver. The high fatality rate usually associated with open drainage has been mentioned. It should be stated, however, that Ochsner and DeBailey¹ succeeded in reducing this fatality rate to only 6.6 per cent in a group of 15 cases in which extraserous drainage was employed. Even this figure could perhaps be further reduced if operation could be avoided. The use of sulfonamide compounds in 1 reported case also has been mentioned. One might predict that, while sulfonamide therapy would tend to prevent the spread of secondary pyogenic infection throughout the liver, it would not be expected to sterilize the abscess itself, since its action, as in empyema thoracis, is greatly interfered with by the presence of pus. The action of penicillin, on the other hand, is not altered by the presence of pus,⁵ as indicated by experimental evidences and its successful clinical use in empyema thoracis and other deep suppurative processes. Therefore one might expect that it would have a favorable effect, particularly when used locally.

It is impossible to judge the value of penicillin in the treatment of secondarily infected amebic abscesses of the liver merely from the results in this 1 case. The practically complete absence of fever or symptoms after a few days of therapy with emetine would seem to indicate that either the streptococcus was of low virulence or that the thick abscess wall minimized the systemic reaction to the infection. However, the organisms were present in very large numbers. While most severe infections in human beings due to beta-hemolytic streptococci are caused by group A organisms, other Lancefield groups may cause infections at times.

Group G beta-hemolytic streptococci were at first thought to be rarely if ever associated with severe human infections,⁶ but more recently they have been reported as the causative organisms in such diseases as recurrent lymphangitis and septicemia,⁷ puerperal fever with and without septicemia,⁸ fatal acute bacterial endocarditis⁹ and 2 cases of subacute bacterial

5. Abraham, E. P., and others: Further Observations on Penicillin, *Lancet* 2: 177-188 (Aug. 16) 1941.

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7. Morales Otero, P., and Pomales Lebron, A.: Grouping of Hemolytic Streptococci Isolated in Puerto Rico, *Proc. Soc. Exper. Biol. & Med.* 34: 105 (Feb.) 1936.

8. Colebrook, L., and Purdie, A. W.: Treatment of 106 Cases of Puerperal Fever by Sulfanilamide, *Lancet* 2: 1237-1242 (Nov. 27) 1937. Ramsay, A. M., and Gillespie, M.: Puerperal Infection Associated with Hemolytic Streptococci Other Than Lancefield's Group A, *J. Obst. & Gynaec. Brit. Emp.* 48: 569-585 (Oct.) 1941.

9. MacDonald, I.: Fatal and Severe Human Infections with Hemolytic Streptococci Group G (Lancefield), *M. J. Australia* 2: 471-475 (Sept. 23) 1939.

4. The penicillin was made available by Dr. Chester S. Keefer, consultant to the Committee on Medical Research, under a contract between the Office of Scientific Research and Development and the Massachusetts Memorial Hospitals.

endocarditis.¹⁰ They have been isolated also from the human respiratory tract¹¹ and other human clinical sources,¹² including the feces. In many of the latter sources they have produced only mild infections or were not pathogenic at all. In the present case penicillin caused the rapid destruction of these streptococci, whatever their effect might have been on the clinical outcome.

A trial of aspiration combined with injections of penicillin for the purpose of avoiding open drainage would seem to be desirable in other cases of this kind. Recent studies¹³ indicate that the dosage of penicillin used in this case was probably unnecessarily large. Thus in the treatment of empyema thoracis it is recommended that 30,000 or 40,000 units be injected once or twice daily. It is probable also that, while in the present case it seemed unnecessary to aspirate material from the abscess cavity repeatedly, other cases might be benefited by this additional procedure. Such aspirations should not be repeated too frequently, however, since it requires at least six or eight hours for penicillin to exert its maximum effect. For the same reason the use of penicillin as an irrigating solution would be illogical.

The results in this case have been encouraging. It is hoped that those who have similar cases will employ this method of treatment in order to determine whether it will be possible to avoid open drainage in secondarily infected amebic abscesses of the liver.

THE INCIDENCE OF COINCIDENT PROSTATIC CALCULI,
PROSTATIC HYPERPLASIA AND CARCINOMA
OF THE PROSTATE GLAND

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ROCHESTER, MINN.

Previous to 1927 it was the opinion of most men interested in urology that prostatic calculi were rarely if ever associated with prostatic carcinoma. It was not until Kretschmer¹ reported 76 cases of prostatic calculi (in 5 of which prostatic carcinoma also was present) that it became generally appreciated that prostatic carcinoma and calculi could occur together.

The practical significance of estimating the incidence of prostatic calculi associated with prostatic hyperplasia and carcinoma of the prostate gland lies largely in the differential diagnosis of prostatic calculi and prostatic carcinoma. For years it has been emphasized that it may be impossible to distinguish a prostatic calculus from prostatic carcinoma by palpation. This problem of differential diagnosis was believed to have been solved by the use of roentgenographic studies of the prostatic region. This was particularly true in the minds of those who believed that prostatic calculi and carcinoma rarely if ever occurred together. Similarly, it often has been stated that prostatic calculi and prostatic hyperplasia are commonly associated, while calculi and carcinoma rarely occur together. This led to the implication that a prostatic calculus that is not associated with prostatitis probably denotes hyper-

10. Solowey, M.: A Serological Classification of Viridans Streptococci with Special Reference to Those Isolated from Subacute Bacterial Endocarditis, *J. Exper. Med.* **76**: 109-126 (July) 1942. Keith, H. M., and Heilmann, I. R.: Subacute Endocarditis Due to Hemolytic Streptococci of Lancefield Group G, *Am. J. Dis. Child.* **65**: 77-80 (Jan.) 1943.

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From the Section on Urology, Mayo Clinic.
1. Kretschmer, H. L.: True Prostatic Calculi; Clinical Data Based on 76 Cases, Surg., Gynec. & Obst. **44**: 163-168 (Feb.) 1927.

plasia. In an effort to determine the validity of these deductions, this investigation was undertaken. Our purpose was to determine how frequently prostatic calculi are found associated with either prostatic hyperplasia or carcinoma.

This study is based on 4,136 cases of prostatic hyperplasia and 686 cases of carcinoma of the prostate gland in which transurethral resection was performed at the Mayo Clinic in a period of five years, that is from 1938 to 1942 inclusive. Roentgenographic examination of the prostatic region was made in all of these cases. These figures do not include cases in which transurethral resection was performed for the removal of calculi that were not associated with hyperplasia or carcinoma, or cases in which satisfactory roentgenographic visualization of the prostatic region was not obtained. Endogenous prostatic calculi were present in 288, or 7 per cent, of the 4,136 cases of hyperplasia (table 1) and in 43, or 6.3 per cent, of the 686 cases of carcinoma (table 2).

TABLE 1.—Incidence of Prostatic Calculi in Cases of Hyperplasia of the Prostate Gland

Year	Hyperplasia, Cases	Cases in Which Calculi Also Were Present	
		Number	Per Cent
1938.....	749	47	6.3
1939.....	783	43	5.5
1940.....	812	45	5.5
1941.....	775	66	8.5
1942.....	1,017	87	8.6
Total.....	4,136	288	7

TABLE 2.—Incidence of Prostatic Calculi in Cases of Carcinoma of the Prostate Gland

Year	Carcinoma, Cases	Cases in Which Calculi Also Were Present	
		Number	Per Cent
1938.....	116	7	6.0
1939.....	125	7	5.6
1940.....	129	8	6.2
1941.....	141	10	7.1
1942.....	175	11	6.3
Total.....	686	43	6.3

SUMMARY

A study of a large series of cases suggests that the incidence of prostatic calculi in cases of hyperplasia and in cases of carcinoma of the prostate is practically identical. This is in disagreement with the commonly accepted dictum that prostatic calculi are rarely found in cases of carcinoma of the prostate gland.

Number of Clinics.—There were 150 clinics in the country in 1900, 2,300 in 1910, nearly 4,000 in 1920, more than 6,000 in 1930. In 1931, 3,456 out of 6,571 clinics in the United States reported over thirty million visits; for all of the clinics in the country, including those not reporting, the number of visits in 1931 is estimated at forty million. A sharp increase in attendance in clinics maintained by the public authorities is reported in nearly every part of the country. A municipal hospital in the Middle West reports a growth in its daily outpatient service from 250 in 1931 to 800 in 1932. The outpatient department of a great municipal hospital in New England reports that daily visits averaged 900 in 1931 and nearly 1,500 in 1932. New York City experienced in 1931 an increase in dispensary attendance of nearly two million visits, equivalent to the entire growth of such attendance during the eight preceding years.—*The Hospital in Modern Society*, edited by Arthur C. Bachmeyer and Gerhard Hartman, New York, Commonwealth Fund, 1943.

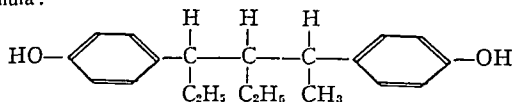
Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

AUSTIN E. SMITH, M.D., Secretary.

OCTOFOLLIN.—2,4-di(*p*-hydroxyphenyl)-3-ethyl hexane. $\text{C}_{20}\text{H}_{26}\text{O}_2$.—M. W. 298.41. Octofollin is one pair of racemates of the synthetic substance possessing the following structural formula:



Actions and Uses.—This compound when introduced into the human body orally and by injection provokes a response similar to that caused by other estrogenic substances. It is claimed to have a low incidence of toxicity. Contraindications are similar to those of other estrogens.

Dosage.—By biologic assay, 1 mg. of Octofollin is reported to be equivalent to approximately 25,000 international units or to 1,250 rat units of estrone. Average dose in tablets is about 2 or 3 mg. and in injection from 2 to 5 mg. This may be repeated daily for four to seven days until the dosage requirement is determined by clinical observation.

Tests and Standards.—

Octofollin is an odorless, white, crystalline powder which melts at from 164 to 166 C. It is readily soluble in acetone, ether, ethanol, methanol and dilute sodium hydroxide solution; soluble in vegetable oils; moderately soluble in glacial acetic acid; slightly soluble in benzene, chloroform, petroleum ether and dilute ethanol; practically insoluble in water and in dilute mineral acids.

Dissolve 10 mg. of octofollin in 2 cc. of concentrated sulfuric acid: a pale yellow color is produced which persists on dilution with water (distinction from diethylstilbestrol, which yields an orange color). Add a few drops of 50 per cent solution of antimony pentachloride in dry alcohol-free chloroform to a very dilute solution of octofollin in the same solvent: a green colored solution which rapidly changes to brown is produced (distinction from diethylstilbestrol, which yields a red or bluish red color).

Add 1 cc. of benzoyl chloride to 0.1 Gm. of octofollin contained in a test tube; heat and maintain gentle boiling for five minutes; cool, add 20 cc. of normal sodium hydroxide and shake the mixture thoroughly until a white solid mass separates. Filter, wash the precipitate with water and recrystallize twice from hot ethanol: the melting point of the 2,4-di(*p*-hydroxyphenyl)-3-ethyl hexane dibenzoate obtained is from 118 to 120 C.

Dissolve 0.1 Gm. of octofollin in 5 cc. of ether: the solution is clear and colorless. Dissolve 0.1 Gm. of octofollin in 5 cc. of previously neutralized 75 per cent ethanol solution: the solution is neutral.

Dry an accurately weighed specimen of octofollin at 100 C. for one hour: the loss in weight does not exceed 0.1 per cent. Ignite an accurately weighed specimen of octofollin after the addition of sulfuric acid: the residue is not more than 0.05 per cent.

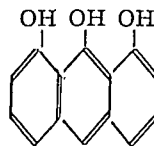
Transfer 0.1 Gm. of octofollin, accurately weighed, to a 100 cc. volumetric flask, add 6 cc. of 10 per cent sodium hydroxide solution and 30 cc. of distilled water; shake to dissolve the octofollin, then dilute to the mark with distilled water. Transfer exactly 20 cc. of the solution to a 250 cc. iodine flask fitted with an accurately ground stopper; add 10 cc. of freshly distilled carbon tetrachloride and 10 cc. of 10 per cent hydrochloric acid. Wet the stopper with distilled water; insert the stopper and shake the flask and contents to dissolve the precipitated octofollin in the carbon tetrachloride layer. Place 2 to 3 cc. of water around the stopper and cautiously remove it, avoiding loss of contents on release of compressed vapor. Rinse down the neck and walls of the flask with 3 to 5 cc. of distilled water. Add exactly 20 cc. of tenth-normal bromide-bromate solution down the wall of the flask and quickly insert the stopper, avoiding possible loss of bromine vapor. Shake the flask and contents thoroughly for several minutes. Place about 5 cc. of 10 per cent potassium iodide solution around the stopper and let the flask stand in the dark for thirty to forty minutes at 25 to 30 C. At the end of this period allow the sodium iodide solution to enter the flask, avoiding loss of vapor from within; place 3 to 5 cc. of distilled water around the stopper and allow it to rinse in the sodium iodide solution. Stopper the flask tightly and shake thoroughly. Let the mixture stand for five minutes and then titrate with tenth-normal sodium thiosulfate solution, shaking the mixture thoroughly after each addition of the reagent. The end point of the titration is reached when on addition of a fraction of a drop of the sodium thiosulfate solution followed by thorough shaking of the mixture the pink color of iodine in the carbon tetrachloride layer disappears. Each cubic centimeter of tenth-normal bromide-bromate solution is equivalent to 3.730 mg. of octofollin: the amount of octofollin found is not less than 99 per cent nor more than 101 per cent.

SCHIEFFELIN & COMPANY, NEW YORK

Solution Octofollin: 10 cc. multiple dose, rubber capped vials, 5 mg.

Tablets Octofollin: 0.5 mg., 1.0 mg., 2.0 mg. and 5.0 mg.

ANTHRALIN.—Signalin.—Dihydroxy-anthranol—1,8,9-anthratrion.— $\text{C}_{14}\text{H}_{10}\text{O}_3$.—M. W. 226.22. Anthralin may be represented by the following structural formula:



Actions and Uses.—Anthralin is recommended as a substitute for chrysarobin in the treatment of psoriasis, having the advantage of less liability to production of dermatitis, less tendency to produce conjunctivitis when used about the face and scalp and less tendency to discoloration of the skin. The preparation has also been recommended in the treatment of chronic dermatomycosis and for stimulating action in chronic dermatoses.

Dosage.—Anthralin is generally employed in concentrations of from 0.1 per cent up to 1.0 per cent in ointments or creams. It is always well to begin with smaller dosages because of a tendency to produce an irritation of the skin.

Tests and Standards.—

Anthralin occurs as an odorless and tasteless, yellow, crystalline powder, which is readily soluble in chloroform, soluble in acetone, benzene and pyridine, slightly soluble in alcohol, ether and glacial acetic acid and insoluble in water. It is soluble in sodium hydroxide solution, yielding a yellow to orange colored solution possessing greenish fluorescence. Alkaline solutions of anthralin rapidly oxidize in air, lose fluorescence and become a deep orange-red. The melting point of anthralin is from 175 to 181 C.

Dissolve about 0.1 Gm. of anthralin in 10 cc. of alcohol, and 0.1 cc. of diluted ferric chloride solution: a greenish brown color results. Add a few crystals of anthralin to 2 cc. of sulfuric acid: an orange-yellow color results (1,8-dihydroxy-anthraquinone gives a scarlet color). Dissolve 0.1 Gm. of anthralin in 10 cc. of warm acetone: the solution is clear; pour the solution into 200 cc. of water: a yellow precipitate results; add 5 cc. of sodium hydroxide solution and mix: the precipitate dissolves and the yellow colored solution rapidly changes to orange and finally to red.

Add about 0.5 Gm. of anthralin to a mixture of 3 cc. of anhydrous pyridine and 3 cc. of acetic anhydride and boil about fifteen minutes. Pour the mixture on crushed ice, collect the precipitate and recrystallize twice from glacial acetic acid: the melting point of the yellow needle shaped crystals of triacetyl anthralin obtained is from 208 to 210 C., with sublimation.

Add 0.5 Gm. of anthralin to 10 cc. of water, mix and filter: the filtrate is neutral; separate portions of the filtrate yield no turbidity on the addition of silver nitrate solution, barium nitrate solution or ammonium sulfide solution, and no color on the addition of ferric chloride solution.

Ignite 0.5 Gm. of anthralin: the ash is negligible.

Transfer 0.1 Gm. of anthralin, accurately weighed, to a beaker, add 75 cc. of acetone and warm to dissolve the solid. While the solution is hot, add 10 cc. of silver ammonium nitrate solution (dissolve 3 Gm. of silver nitrate in 120 cc. of water and add 10 cc. of 10 per cent ammonium hydroxide solution), mix and allow to stand at room temperature for two hours. Filter through a suitable Gooch crucible (or sintered glass filter). Wash the beaker and crucible with ether, acetone, then about 300 cc. of ammoniacal ammonium nitrate solution (dissolve 15 Gm. of ammonium nitrate in 300 cc. of water and add 10 cc. of ammonium hydroxide solution) and finally wash with acetone. Place the filter in the beaker used for the precipitation of silver, add 10 cc. of water and 10 cc. of nitric acid and heat to near boiling to facilitate solution of the silver. Add enough water to cover the filter and boil gently for twenty minutes. Add 0.5 Gm. of chloride free decolorizing charcoal, mix, let stand for ten minutes and filter while hot through paper. Rinse the beaker and crucible with hot water and finally wash the paper and residue with hot water; combine the filtrate and washings. Cool and titrate with tenth-normal ammonium thiocyanate, using 5 cc. of ferric ammonium sulfate solution, acidified with nitric acid, as the indicator. Each cubic centimeter of tenth-normal ammonium thiocyanate is equivalent to 0.01079 Gm. of silver. The amount of silver precipitated, calculated from the titration, is not less than 1.35 times and not more than 1.45 times the amount of anthralin taken.

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Anthralin Ointment: 0.1%, 0.25%, 0.5% and 1%. Anthralin in petrolatum base.

Anthralin Cream: 0.1%, 0.25% and 0.5%. Anthralin in a vanishing cream base of potassium stearate, glycerin and distilled water.

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Undulant Fever Vaccine, Melitensis: 6 cc. and 20 cc. diaphragm stoppered vials. Each cubic centimeter contains 2,000 million each of killed Brucella melitensis, preserved with 1:10,000 merthiolate.

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SATURDAY, MARCH 4, 1944

THE SULFONAMIDES

The favorable effects of the widespread clinical use of the sulfonamide compounds¹ is now reflected in statistics of mortality. Investigations of the principles which govern their effectiveness, as well as interest in chemotherapy in general, have been stimulated. A symposium by the New York Academy of Sciences² presents much recent information.

The action of the sulfonamides is best evident in disease produced by certain organisms and characterized by acute onset with rapid invasion of the tissues. Rapid invasion is in part concerned with rapid growth of bacteria; the curative action of the sulfonamides is no doubt one of bacteriostasis.

The manner in which sulfonamides produce bacteriostasis is partially understood. The inhibition of the action of sulfonamides by para-aminobenzoic acid is well known. In addition amino acids such as methionine, aminoacetic acid, serine and xanthine have been shown to alter, under certain conditions, the sulfonamide effect. At present it is thought that para-aminobenzoic acid is an essential metabolite for bacterial growth and that there is competitive inhibition by the sulfonamides of the enzyme systems in which it is normally involved.

In order to affect bacteriostasis the sulfonamide compound must reach the bacteria in effective concentration. This means, among other things, that there must be adequate blood supply to the lesion. However, the important factors which influence the attainment of an effective concentration are the absorption, distribution and ultimate excretion of the drugs.

The rate and degree of absorption of the various compounds differ. Use is made of the fact that the gastrointestinal absorption of compounds such as succinylsulfathiazole is low, while that of other compounds, such as sulfamerazine, is rapid and complete.

The commonly used sulfonamides are diffusible throughout all of the body water and appear in the various fluid compartments. In addition, sulfapyridine,

sulfathiazole and sulfamethylthiazole are actually concentrated within certain tissue cells. In the cerebrospinal fluid the concentration, relative to the blood concentration, is somewhat lower for all sulfonamide compounds. This is in part due to the tendency of the sulfonamides to combine with plasma proteins, forming a nondialyzable fraction, and in part to the mechanism of formation of the cerebrospinal fluid. The extent of the plasma binding is sulfadiazine 20 per cent, sulfapyridine 30 per cent, sulfamerazine 40 per cent and sulfathiazole 60 per cent.

The persistence of the sulfonamides in the tissues is in large part due to the manner and thus the rate of their renal excretion. The degree of plasma binding may be concerned in this process. However, the blood concentration and the type of renal tubular phenomena are the most important factors. Sulfathiazole and sulfamethylthiazole are excreted from the body relatively rapidly because they are reabsorbed little, if any, in the tubules. However, sulfapyridine, sulfadiazine and sulfamerazine are slowly eliminated because of substantial and perhaps active tubular reabsorption.

In the metabolism of the sulfonamide compounds the body converts them in part into less bacteriostatic, acetylated forms. These acetylated forms are also eliminated in the urine and there is some indication that in the case of sulfathiazole the high incidence of renal complications may be due to the rather poor solubility of the acetylated form at the p_H of the urine.

The question of the toxicity of the sulfonamides is important but not well understood. The toxic phenomena are related to the blood concentration of these agents and the duration of treatment with them. The absence of any striking increase in the incidence of toxic phenomena with intentionally excessive blood concentrations or excessively prolonged therapy indicates that these are not the sole factors. To say that toxic reactions not explainable by excessive blood levels or a too prolonged administration are due to idiosyncrasy is begging the question, since so little is known relative to aberrant drug responses. Sensitization appears to assume a role in some cases. The recent observations that in animals the administration of some of the less absorbable sulfonamides causes vitamin deficiencies by decreasing the numbers of *Escherichia coli* which synthesize these vitamins in the gastrointestinal tract³ suggest another mechanism by which toxic phenomena may be brought about.

The relatively simple chemical structure of the sulfonamides has led to a certain degree of correlation between physical and chemical properties and bacteriostatic action, so that the chemist can in part predict the potency of new compounds. However, owing to the absence of such information relative to toxicity, the usefulness of newer sulfonamides awaits actual animal and clinical study.

1. Stocks, Percy: *Vital Statistics of 1942*, *Lancet* 1: 672, 1943.
2. *Annals of the New York Academy of Sciences* 44: 445, 1943.

3. Elvehjem, C. A.: *Present Status of the Vitamin B Complex*, *American Scientist* 32: 25, 1944.

GENETIC FACTORS IN TUBERCULOSIS

Although exposure to infection is an important factor in the etiology of tuberculosis, variability in individual susceptibility or resistance may be a function of the genetic constitution. Lurie's work¹ in inbred rabbit stocks is one of the most extensive documented experimental approaches to this thesis. Consistent inbreeding of rabbits led to the development of three different family groups with respect to the resistance to natural or experimental tuberculosis: a highly resistant family displaying a localized chronic ulcerative form of pulmonary tuberculosis on inoculation with large doses of bacilli, several nonresistant families in which a rapidly progressive and generalized disease occurred and some moderately resistant families showing various intermediate forms of the disease. Lurie concluded that the resistance of rabbits to naturally or artificially acquired tuberculosis is largely controlled by their genetic constitution.

By using the so-called twin method in a statistically representative number of cases, Kallmann and Reisner² have found Lurie's conclusions valid in spontaneous human tuberculosis. The significance of the twin method depends on the distinct hereditary differences between the categories of monozygotic and dizygotic twins. Monozygotic twins occur as the result of the division of the embryo at an early stage of development. Since the two halves are derived from a single fertilized ovum, each will carry precisely the same complement of genes. Such twins are always of the same sex and are genetically as identical as the right and left halves of a single individual. Dizygotic twins result from two separate ova which were fertilized at the same time. Genetically they are no more alike than any other pair of brothers and sisters who are born at different times.

The twin index cases were collected from tuberculosis hospitals and clinics in New York. The study included 308 pairs consisting of 616 twins, of whom 334 were index cases affected by reinfection tuberculosis. There were 78 monozygotic and 230 dizygotic twin pairs. In addition to 616 twin partners the investigation was extended to 930 full siblings, 74 half siblings and 226 marriage partners of the twin partners. Comparison of the morbidity rates in these families disclosed that the chance of developing tuberculosis increased in strict proportion to the degree of blood relationship to the tuberculous index case. In 87.3 per cent of the monozygotic twins, both partners had reinfection tuberculosis. In contrast, only 25.6 per cent of the dizygotic partners of the index case developed the disease. The morbidity rate among the other members of the families amounted to 25.5 per cent in the full siblings, 11.9 per cent in the half siblings and 7.1 per cent in the marriage

partners. This direct correlation between consanguinity and incidence of tuberculosis was remarkably consistent and undoubtedly specific. When, in addition, the lack of correlation between opportunities for exposure and frequency of tuberculosis is considered, it seems most likely that the differences in morbidity rate were essentially dependent on genetic differences. Moreover, the morbidity rate in the monozygotic cases was independent of the occurrence or absence of tuberculosis in the parents, being largely determined by the identical genetic constitution as the tuberculous index cases. Likewise a genetic mechanism was found to modify individual resistance to tuberculosis, as evidenced by the demonstration of similarities in extent, course and outcome of the disease in the monozygotic twin partners. Similar behavior to the disease was about eight times more frequent than dissimilar behavior in monozygotic twins, while it was only half as frequent in dizygotic twin partners. Statistically the possibility of dying from tuberculosis is practically zero for a tuberculous monozygotic twin if the other partner remains free from tuberculosis despite definite exposure to infection. Resistance to the disease was definitely a function of the genetic constitution.

THE MICROBIOLOGIC MEASUREMENT OF AMINO ACIDS

A normal life process is impossible unless each of the essential amino acids is furnished the organism. Moreover, the biologic value of each of the proteins in food is also dependent on the relative composition of these essential amino acids. Obviously, therefore, the measurement of these building stones of protein should be accurate and readily available.

Until now the quantitative measurement of the amino acids in food and other proteins has been relatively easy only in some cases. Many of these amino acids are closely related chemically. Many exist in optically active forms which must be differentiated; in certain instances only the levorotatory form can be utilized by the organism, while the dextrorotatory is without value in the synthesis of protein. This is important, because many synthetic amino acids have become available as racemic mixtures.

Study of bacterial growth has furnished an interesting and important solution of this quantitative problem. It has been referred to as a microbiologic method and introduces a new approach to the quantitative measurement of certain biologic substances essential for bacterial growth and present in food and in tissues. The first demonstration of the value of this method was reported only a few years ago by Snell and Wright¹ in the chemistry department of the University of Texas.

1. Lurie, M. B.: Heredity, Constitution and Tuberculosis: An Experimental Study, supplement to *Ann. Rev. Tuberc.* **44**: 1 (Sept.) 1941.
2. Kallmann, F. J., and Reisner, David: Twin Studies on Genetic Variations in Resistance to Tuberculosis, *J. Heredity* **34**: 269 (Sept.), 293 (Oct.) 1943.

1. Snell, E. E., and Wright, L. D.: *Biol. Chem.* **139**: 675 (June) 1941.

They found that nicotinic acid (niacin) could be measured accurately by following the growth of *Lactobacillus arabinosus* on a purified basal medium lacking only this vitamin and to which various amounts of the unknown is added. They found that this method was rapid and accurate and compared well with the chemical and the dog method which had been previously employed. Moreover, they were able to determine with an accuracy of 8 per cent of nicotinic acid added to various tissues which were thus analyzed. The establishment of the quantitative requirements of amino acids by growing bacteria² naturally led to the employment of this method for the determination of various amino acids. Shankman, Dunn and Rubin³ at the University of California at Los Angeles presented a series of analytical data and found that this method yielded an average accuracy of 3.3 per cent as determined by the results obtained by adding known amounts of amino acids to the basal medium. Later these workers⁴ used another bacterium, *Lactobacillus casei*, and reported determinations for glutamic acid, leucine, phenylalanine, tryptophan, tyrosine and valine. In a paper appearing at the same time from the Texas Agricultural Experimental Station, Kuiken and his co-workers⁵ determined accurately values for valine, leucine and isoleucine with *Lactobacillus arabinosus*.

This new method is apparently precise, because growing bacteria have rigid requirements for the various amino acids and are able to discriminate not only between the natural and unnatural forms but also the various amino acids closely related as, for example, leucine and isoleucine. Should this new method become widely used and its accuracy confirmed by other workers, it will undoubtedly open a new era in our knowledge of the amino acid composition not only of food proteins but also of the various tissue proteins and body fluids. In the past the biologic value of proteins was determined almost entirely by growth experiments, by nitrogen balance experiments or by the ability of the organism to synthesize plasma proteins and in only a limited way by their chemical composition. While analysis of certain amino acids such as tryptophan and tyrosine is satisfactory, this new method is undoubtedly a great advance in the determination of many of the others. Moreover, it requires much smaller samples than many of the older methods. Thus it will be possible to restudy more precisely and more accurately the full amino acid composition of many of the food proteins. Moreover, it will perhaps stimulate many advances in our knowledge of the behavior of amino acids within the fluids and tissues of the animal organ-

ism where they are present in small concentrations, as for example in the circulating plasma. The picture of protein and amino acid metabolism is now known to be rapidly changing and therefore requires more accurate analytical procedures even to fill in its broad outlines, not to mention its finer details.

Current Comment

CLINICAL RECOGNITION OF CORONARY THROMBOSIS

On the insistence of his professional friends, Dr. James B. Herrick somewhat reluctantly consented to tell of his early experiences with coronary occlusion.¹ As early as 1910 he was called to see a man who was seized one hour after a moderately heavy midnight meal with severe pain in the lower precordial region. The patient's mind was clear. There was moderate cyanosis and some dyspnea. The chest was full of fine and coarse moist rales. There was a running feeble pulse of 140. The patient died fourteen hours after the onset of pain. Impressed with reading of the case of Panum, which resembled this case closely, Dr. Herrick told Dr. Hektoen, who was to perform the necropsy, that he would most likely find a "clot in the coronary artery." The postmortem examination revealed a red thrombus completely occluding the coronary artery a short distance from its origin, well defined areas of yellowish and reddish softening in the wall of the left ventricle and acute fibrinous pericardial deposit over the left ventricle. Shortly afterward Dr. Herrick was able to make an antemortem diagnosis of coronary occlusion in a man who lived seven days after the onset of pain. From his observations on these 2 cases and from an exhaustive study of medical writings, Dr. Herrick derived a theoretical conclusion that "there is no inherent reason why the stoppage of a large branch of a coronary artery, or even of a main trunk, must of necessity cause sudden death. Rather may it be concluded that, while sudden death often does occur, at times it is postponed for several hours or even days, and in some instances a complete, i. e. functionally complete, recovery ensues." Coronary thrombosis was, of course, well known to early pathologists and was accurately described by many, to quote only René Marie and M. Sternberg. Its true clinical significance was, however, little appreciated either in Europe or in the United States. The next step in the evaluation of our knowledge of coronary occlusion was the demonstration by Dr. Fred Smith, Dr. Herrick's associate, "that a fairly constant change in the electrocardiogram was brought about by ligation of coronary arteries in the dog, so that one could predict with reasonable certainty the alteration that would appear in the tracing after experimental stopping of circulation in particular branches." These observations were reported by Dr. Smith in the *Archives of Internal Medicine* in July 1918.

2. Shankman, S.: *J. Biol. Chem.* **150**:305 (Oct.) 1943.

3. Shankman, S.; Dunn, M. S., and Rubin, L. B.: *J. Biol. Chem.* **150**:477 (Oct.) 1943.

4. Shankman, S.; Dunn, M. S., and Rubin, L. B.: *J. Biol. Chem.* **151**:511 (Dec.) 1943.

5. Kuiken, K. A.; Norman, W. H.; Lyman, C. M.; Hale, Fred, and Blotter, Lois: *J. Biol. Chem.* **151**:615 (Dec.) 1943.

1. Herrick, J. B.: *An Intimate Account of My Early Experience with Coronary Thrombosis*, *Am. Heart J.* **27**:1 (Jan.) 1944.

This important clinical contribution is a demonstration of the power of scientific observation and of analysis. Dr. Herrick firmly believed that discoveries in the clinical field did not depend exclusively on the use of elaborate instruments and laboratory methods. He expressed this idea clearly in one of his early papers on the subject: "This address, if it accomplishes its aim, will encourage the specialist and the research worker to go forward with the use of the newer instruments and with the investigations by which new facts concerning the heart will come to light. It will also, I trust, encourage the general practitioner to retain some of his old self confidence and not to lose faith in his powers of observation and in his ability to analyze subjective symptoms; and still to believe that it is possible by well established methods of physical diagnosis to understand many of the anatomic, pathologic and physiologic conditions of this important organ."

TREATMENT OF HAEMOPHILUS INFLUENZAE INFECTIONS

In view of the conflicting opinions as to the most effective agent for the treatment of influenzal meningitis in children, Alexander and Leidy¹ analyzed the comparative value of sulfonamide drugs and serum in experimental influenzal infections. Type B Haemophilus influenzae obtained from spinal fluid was suspended in mucin, which enhances its virulence and permits experimental studies with small numbers of organisms. The mouse protection test, which has been thoroughly standardized, and the inhibitory capacity on culture growth of the organism were used in the determination of the effectiveness of serum and sulfonamide drugs. There was a direct correlation between the protective value of these agents in mouse infections and their inhibitory capacity in test tubes. Of the sulfonamides tested, sulfadiazine proved to be the most effective drug. In mice 0.4 mg., yielding a blood concentration of 1.6 mg. per hundred cubic centimeters after twenty hours, was effective in protecting against 1,000 minimal lethal doses. Sulfapyridine was much less effective, as a dose fifteen times higher than that of sulfadiazine was required to provide identical protection. Sulfanilamide was the poorest drug in this respect. Only huge lethal doses had some degree of effectiveness against 1,000 minimal lethal doses. As compared to sulfadiazine, type specific rabbit antibody proved to possess equal protective value against H. influenzae mouse infections. However, regardless of the dose administered and of the blood concentration obtained, both sulfadiazine and serum, when used singly, failed to protect regularly when the dose of organisms inoculated exceeded 10,000 minimal lethal doses and were completely ineffective against 1 million minimal lethal doses. When serum and sulfadiazine were combined, the mice regularly withstood 1 million minimal lethal doses. The synergistic action of these two agents is of great importance in the treatment of

severe B type H. influenzae meningitis in infants and children, in which the death rate may be reduced to a minimum by the combined use of serum and sulfadiazine.

ROENTGEN THERAPY OF GAS GANGRENE

On February 9 the Associated Press carried a story from Omaha to the effect that Dr. James F. Kelly, Omaha physician and x-ray physician at Creighton University, had charged that sulfonamides are being used ineffectively in the treatment of the war wounded suffering from gas gangrene in cases in which x-ray therapy would halt or prevent infection and make amputation of legs and arms unnecessary. According to the item from the Associated Press, Dr. Kelly had asserted that "the United States Public Health Service and the National Research Council had failed to investigate thoroughly the use of x-ray in prevention of wound infection and the American Medical Association had failed to report favorable results attained from x-ray." Following publication of this item, the Office of the Surgeon General of the United States Army requested the National Research Council, through the Subcommittee on Radiology of the Division of Medical Sciences, to consider the matter. This was done immediately and the following resolution was adopted:

The place of x-ray therapy in the management of cases of gas gangrene has been a concern of this Committee for several years. In future as in the past, the Committee will continue to concern itself with this problem. The present opinion of the Committee based upon continuing study of the work of many investigators is that, up to the present time, the effectiveness of x-ray in the treatment of gas gangrene has not been established. For this reason, the use of x-ray therapy in gas gangrene is still experimental.

The Subcommittee on Radiology also approved the statement from the Office of the Surgeon General of the United States Army with regard to the treatment of war wounds with x-rays prepared by the Technical Information Branch on February 9. Both of these actions of the Subcommittee on Radiology have been approved by the chairman of the Committee on Surgery and also by the Subcommittee on Infected Wounds and Burns of the National Research Council.

ARMY SPECIALIZED TRAINING PROGRAM FOR PREMEDICAL AND MEDICAL STUDENTS TO BE CONTINUED

Information received as THE JOURNAL goes to press indicates that the needs of the armed forces and the civilian population for a continuing supply of physicians have been recognized. Announcement is made that both premedical and medical students will be continued under the Army Specialized Training Program as heretofore. Just how long the program will be continued with government support has not yet been stated. However, the actions taken by the Selective Service System with the approval of the Army and Navy indicate that there is every intention to defer medical and premedical students in recognized institutions who maintain proper standards of scholarship, whether or not the A. S. T. P. is continued.

1. Alexander, Hattie E., and Leidy, Grace: Experimental Investigations as a Basis for Treatment of Type B Haemophilus Influenzae Meningitis in Infants and Children, *J. Pediat.* 23: 640 (Dec.) 1943.

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeons General of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war, and such other information and announcements as will be useful to the medical profession.

AMERICAN CIVILIANS IN A JAPANESE INTERNMENT CAMP

Frank E. Whitacre, M.D.

Recent Repatriate on M/S Gripsholm

SYLVANIA, OHIO

During the first few weeks of internment in a Japanese concentration camp at Manila, Philippines, a group of 3,900 internees (about 80 per cent Americans), with courageous spirit and without help from the Japanese, organized themselves into a smooth running community, of which the hospital formed an important part. A few hours after Pearl Harbor the Japanese were attacking the Philippines in force. A few civilian physicians assisted in the Sternberg military base hospital until the hospital was closed at the time of the retreat to Bataan. Most of our seriously wounded men from the bombings at Clark, Nichols and Nielson airfields, and also from the Cavite naval yard, were transferred the latter part of December to Australia on a hospital ship. The fall of Manila was imminent, and we remained at our hotel until the Japanese army entered the city on Jan. 2, 1942.

THE CAMP AT SANTO TOMAS

On January 5 we were taken in trucks and busses to Santo Tomas internment camp. Santo Tomas is the oldest university under American protection and consists of some 50 acres and thirteen buildings. About two thirds of the acreage and most of the buildings were turned over to us by the Dominican Fathers. This gave each person only about 30 square feet of floor space. The Japanese did not furnish beds, bedding or cots but allowed us to obtain a few necessities wherever we could. The American aptitude for organization was soon in evidence. The Japanese did not look after details of organization and management but permitted the internees to do that themselves. An executive committee was elected, with a chairman responsible to the Japanese commandant. Various committees were formed, including finance and supply, sanitation and hygiene, order and safety, construction, work assignment, kitchens, medical attention, education, religion, recreation and entertainment, and in fact committees to cover all of the main functions required in the operation of a community of this size.

SUPPLIES FROM THE RED CROSS

For the first few months our food and supplies came from Red Cross organizations. On July 1, 1942 the Japanese government for the first time began to supply funds for the support of the camp: 70 centavos (35 cents) a day per person. Later this was increased to 1 peso (50 cents), which had to take care of everything for the support of the camp; electricity, water and all supplies, including food. There were three kitchens, which were operated by the internees in a clean and efficient way. Two meals were served "on the line" daily, consisting of rice, green vegetables, a small amount of meat twice a week and occasionally fruit. Although fruit is abundant in the Philippines, the lack of transportation reduces the available supply. Persons with sufficient funds were permitted to have food sent in to them, usually one cooked meal a day, and this "package line" served about 1,000 persons. In twenty-two months we each received two Red Cross gift packages, from Johannesburg, South Africa, and Toronto, Canada, respectively. The average diet provided only approximately 1,800 calories a day, containing about 50 Gm. of protein and around 30 Gm. of fat; no more than half of the latter was obtained

from animal sources. It is not surprising, therefore, that a loss of weight of from 30 to 50 pounds was common, and that borderline avitaminosis was prevalent.

ATTITUDE OF THE JAPANESE

The treatment of the internees by the Japanese was characterized chiefly by indifference. The close confinement and the lack of adequate food were a constant menace. During the first several months of internment about 1,000 sick and elderly persons were allowed to leave the camp if they could show that they had a place to stay and could be self supporting. But in May 1943, coincident with Premier Tojo's visit to Manila to offer the Philippines independence, almost all of these persons were brought back into camp. It was a pitiful sight, as room after room in the buildings used for sleeping quarters literally had to be converted into an old persons' home. The camp was already overcrowded, owing to the gradual accumulation of small groups brought in from time to time from the provinces. This reinternment necessitated the moving of 800 young and middle aged, able bodied men to Los Baños, 40 miles distant.

THE CAMP HOSPITAL

Medical attention was efficient, as far as this was possible. After one or two rooms had been used for the first few days, a small hospital of 80 beds was set up in a one story frame building which had been the metallurgy department of the university. This hospital was well defined into two women's wards and two men's wards, an outpatient department consisting of a waiting room, treatment room and facilities for minor surgery, and an adequate dental department. Perhaps it would be better not to mention any names at all in this brief report, but it seems only fair to mention two: Dr. Charles N. Leach of Burlington, Vt., a field director of the Rockefeller Foundation, was responsible for the organization and direction both of the hospital at Santo Tomas and of the hospital at Los Baños. Dr. Hugh L. Robinson of Auburndale, Mass., carried the load of individual medical attention. In August 1942 the hospital was moved to another building, which permitted better facilities and 120 beds. At present the physicians remaining with our people in the Philippines are doing the best they can with the supplies they have at hand.

The camp hospital was excellently staffed with nurses, at first from the internees, a few nurses from the Philippine Red Cross, and the Mary Knoll Sisters. A few months later eleven Navy and sixty Army nurses accepted this responsibility and continue to provide the best of nursing care.

HELP FROM THE FILIPINOS

We appreciated the brave and dependable Filipino people. Aside from invaluable assistance, both individually and collectively, to the internees, the officials of the Philippine General Hospital made available one 50 bed ward for men, which was always filled to capacity, and one 12 bed ward for women. In many instances the vaguest promise to pay sometime was sufficient during this emergency. Also complete medical, surgical, laboratory and roentgen ray facilities were provided whenever necessary.

EPIDEMICS

Among the medical conditions seen in the camp, the first to reach epidemic proportions was enteritis in the early spring of 1942. The causative organism was one of the salmonella group. This was shortly followed by amebic dysentery. In July an arrogant and officious major of the Japanese military medical service investigated the camp and was very unkind to the director of our hospital, who was in no way to blame for the wave of enteric conditions affecting the camp. Many typical cases of dengue fever, as well as influenza, were seen in the early months of internment. This was followed by an epidemic of about 150 cases of catarrhal jaundice. Also malaria was present among people brought in from the provinces, but there was no malaria which could be traced to the Manila area. About 12 patients with anterior poliomyelitis were seen, and shortly thereafter approximately the same number were afflicted with herpes zoster. Venereal diseases were prevalent only during the first few months, at which time 50 patients with syphilis were treated. Some 20 patients with active pulmonary tuberculosis were segregated from the sleeping rooms. A survey of the camp, involving two thousand fluoroscopic examinations, added to the protection of all persons. About 150 persons were grouped and catalogued as blood donors in order to be prepared should occasion for their need arise, and they have been very useful.

No epidemics have occurred among the 300-odd children, who are doing very well; milk supplies are reserved for them. The children have their separate hospital of 15 beds. The ordinary diseases of childhood have not been a serious problem, and fortunately scarlet fever is rare, if not unknown, in the Philippines.

The vitamin deficiencies previously mentioned are chiefly due to a lack of vitamin B₁, characterized by paresthesias and diffi-

culty in focusing the eyes. Riboflavin deficiency was manifest by pigmentation around the nose and mouth, sore tongue and diarrhea. A few cases of pernicious anemia and sprue were seen; also many cases of diabetes and peptic ulcer. A considerable number of hernias, mostly inguinal, were probably due to the fact that middle aged and older men who had done office work all their lives found it necessary to do heavy work on an inadequate diet. It seemed that arteriosclerosis and enlargement of the prostate gland were at least as numerous as would be expected in a corresponding group living under normal conditions.

One should not fail to mention the mental retardation that accompanies confinement. Immediately following the bombings and in the early days of internment, occasional hysteria was seen, but after many months lethargy and mental deterioration affected a moderate number of persons.

MORTALITY

The number of deaths after twenty-two months is probably not much in excess of that found in a group of the same size in normal times. But it must be expected that the mortality rate will increase, for nutritional disturbances are growing and the drug and medical supplies situation is deplorable. There are no drugs for treating dysentery; the supply of insulin and liver extract is almost exhausted; there are practically no sulfonamide drugs, narcotics, anesthetics or glucose. It is to be hoped that out of the vast supplies sent to the Far East a fair portion of the vitally needed drugs and nutritious foods will be made available to our people in the Philippines to improve their gloomy situation. Better still, it is to be hoped that the many efforts of our government for further repatriations will be successful.

ARMY

PHYSICAL EFFICIENCY RATINGS
FOR TRAINEES

Army Service Forces Circular No. 25 states that training in medicine under the Army Specialized Training Program will terminate on the issuance of a certificate of successful completion of the prescribed course of medical instruction. Graduates who are discharged from their enlisted status in order to accept appointment in the Medical Corps Reserve or Medical Corps, A. U. S., will not be called to active military duty until they have completed the nine months internship, as now prescribed, if the military situation permits. Such internships will be served in an inactive status, that is, as civilians, and will be contracted for individually by the prospective graduates during their senior years.

The War Department desires that the internship be served in hospitals approved for intern training by the Council on Medical Education and Hospitals of the American Medical Association, and that, in view of the need for interns in hospitals within the United States, contracts be not accepted for internships in Canadian hospitals. There is no objection to accepting and serving the prescribed hospital internship in the territories of the United States or the Canal Zone, in hospitals which will coordinate their intern-resident training programs with the accelerated medical program and with the intern-resident program of Procurement and Assignment Service for Physicians, Dentists and Veterinarians, War Manpower Commission.

In general, unless the exigencies of the military situation require earlier call to active duty, appointed medical officers will be ordered to active duty by the War Department not later than ten months after appointment, except that not to exceed one third of the total number of such interns available for call to active duty in any calendar month, if certified to the War Department by the War Manpower Commission (Procurement and Assignment Service for Physicians, Dentists and Veterinarians) as essential junior hospital residents within a ceiling quota for such residents allocated by that agency to each state and hospital, will be continued in an inactive status by the War Department for an additional period of nine months. One half

of the number deferred from call to active duty as junior residents who are subsequently available for call to active duty in any calendar month will, if similarly certified, be continued on an inactive status for an additional period of nine months as senior residents.

Present plans contemplate that, on being ordered to active duty within ten months after appointment, or on completion of junior or senior residency, if authorized, officers will be sent to the Medical Field Service School for a period of approximately six weeks. It is further contemplated that those ordered to active duty within ten months after appointment will be assigned for a period of six weeks to an army general hospital prior to definite duty assignment.

COL. DALE G. FRIEND AWARDED LEGION
OF MERIT FOR SOUTH
PACIFIC ACTION

Col. Dale G. Friend, formerly of North Attleboro, Mass., was awarded the Legion of Merit for "exceptionally meritorious conduct in the performance of outstanding services as commanding officer of a medical regiment and as division surgeon of an infantry division from Jan. 19, 1942 to March 22, 1942 in the South Pacific Area." The citation accompanying the award read as follows: "Award of the Legion of Merit. Dale G. Friend, Colonel, Medical Corps, United States Army, for exceptionally meritorious conduct in the performance of outstanding services as commanding officer of a medical regiment and as division surgeon of an infantry division from Jan. 19, 1942 to March 22, 1942 in the South Pacific Area. Under Colonel Friend's leadership the medical regiment was brought to the highest standard of efficiency and provided excellent service in the field for the division during its successful combat operations at Guadalcanal. Due to his professional ability, zeal and ingenuity, the treatment of the sick and wounded and evacuation to higher medical echelons under extremely adverse conditions were marked by speed and efficiency of the highest order."

Dr. Friend graduated from Harvard Medical School, Boston, in 1935 and entered active service Jan. 16, 1941. He has served seventeen months overseas, six months of which was in combat.

INTERNS AND RESIDENTS HOLDING MEDICAL ADMINISTRATIVE CORPS COMMISSIONS URGED TO ACCEPT MEDICAL CORPS COMMISSIONS

There are still a few interns and residents who hold commissions in the Medical Administrative Corps who have failed to convert their commissions to the Medical Corps. Detailed instructions have been mailed to the remaining interns and residents, giving the procedure to be followed. In certain instances the conversion requests have been ignored, under the impression that a Medical Administrative Corps commission would assure a delay in a call to active duty. It has been pointed out that a failure to comply with the conversion requests within a reasonable period may result in an immediate call to duty as a Medical Administrative Corps officer. Every effort should be made by all concerned to comply with the requests of the Surgeon General and effect immediate conversion.

SOLDIER'S MEDAL AWARDED TO ARMY NURSE

The War Department recently announced the award of the Soldier's Medal to 1st Lieut. Oral D. Stephenson, Army Nurse Corps, chief nurse at the Station Hospital, Morris Field, Charlotte, N. C., for heroism in the rescue of a nurse from a burning building. Lieutenant Stephenson was awakened Nov. 9, 1943 by the smell of smoke from a fire in the nurses' quarters. She acted immediately to arouse other occupants of the building. Hearing a scream from one of the rooms, she fought her way through flames and smoke and found an unconscious nurse. Although the latter was much heavier than she, Lieutenant Stephenson dragged her to safety through the blazing hall. Lieutenant Stephenson was burned about the face and hands and was partly overcome by smoke. She was graduated in June 1929 as a nurse at the Jennie Edmundson Memorial Hospital, Council Bluffs, Iowa, and entered the Army Nurse Corps on Dec. 15, 1940 at Letterman General Hospital, San Francisco. She was promoted to chief nurse on Dec. 3, 1941. Lieutenant Stephenson is the third army nurse to receive the Soldier's Medal.

SEVENTH MEDICAL BATTALION CITED

The War Department recently announced the citation of the Seventh Medical Battalion. This unit accomplished rapid evacuation throughout the entire action on Attu Island despite extremely difficult terrain and unfavorable weather conditions. At all times collecting and clearing installations were kept in close support of the advancing troops. Even though the battalion was augmented during critical periods with a miscellany of other troops untrained in medical department duties and not organized to operate in small independent litter groups, it functioned capably under fire. On May 29, 1943 four medical installations of this battalion were overrun by the enemy. In all instances officers and enlisted men stayed with the wounded, giving them valuable medical aid. Although all four installations suffered casualties during the thirty-six hour period following this assault, by gallant efforts the majority of the wounded troops were evacuated alive when the enemy was cleared from the area.

ORIENTATION COURSE FOR OCCUPATIONAL THERAPISTS

Orientation courses for newly appointed occupational therapists will be conducted to make them familiar with the organization of the Army, of the medical department, of army hospitals, and with the particular problem of the care and treatment of sick and wounded military personnel, according to Headquarters Army Service Forces. Commanding generals of service commands will assign newly appointed occupational therapists within certain allocations to attend these courses and on completion of the course to report to the general hospital of permanent assignment. The initial appointment of such civilian occupational therapists should be so dated that on reporting for duty they can be sent immediately to the course. Travel from the place where the occupational therapist reports for

duty to the general hospital where the course is given, and return to the hospital of assignment, will be at government expense. Orders governing such travel and per diem allowances will be issued by the service command in the same manner as for other civilian employees. Housing and messing facilities are available at Lovell General Hospital (Fort Devens, Mass.) and Lawson General Hospital (Atlanta, Ga.) at the customary charges, but not at Letterman General Hospital (San Francisco). The Adjutant General, the Surgeon General, the commanding general or commanding officer of the general hospital giving the course, and the headquarters of the service command in which the general hospital is located will be furnished a copy of each order issued.

APPETIZING HOSPITAL RATIONS FOR WOUNDED OVERSEAS

The War Department announced recently that a special hospital ration has been developed by the Quartermaster Corps for use in field hospitals overseas which has been made appealing to the eye as well as to the appetite. Sufficient for 25 men for one day, the ration includes a variety of canned fruits, fruit juices, dehydrated soup, coffee, sugar and evaporated milk. Each of the components is packed in a metal container. The complete ration, boxed and marked with the Red Cross insignie, weighs about 60 pounds and is readily transported even to hospitals in the battle zones. The hospital ration was designed to supplement standard field rations ordinarily served wounded men in theaters of operation and to meet the dietary needs of hospitalized soldiers.

ROOMS NAMED IN MEMORY OF BATAAN NURSES AT FINNEY GENERAL HOSPITAL

The nurses' quarters at Finney General Hospital, Thomasville, Ga., have been specially fitted out as a memorial to nurses who performed such noteworthy services in the Philippines, with rooms named for those nurses who were left behind on Bataan at the time of its surrender. Col. Samuel W. Browne, commanding officer of the hospital and a veteran of World War I, who knew many of these nurses personally, had seven plaques made, one for each of the nurses' quarters and bearing five names each, to commemorate the gallant and unselfish service which they gave on Bataan.

PURPLE HEART AND OAK LEAF CLUSTER TO CAPT. JAMES C. LEFON

Capt. James C. LeFon, formerly of Richmond, Va., was recently awarded the Purple Heart and also the Oak Leaf Cluster. He has been wounded twice while performing duties on the front and is at present with the Fifth Army in Italy. Dr. LeFon graduated from the Medical College of Virginia, Richmond, in 1931 and entered the service in June 1942.

ADMINISTRATIVE FUNCTIONS OF SPECIAL PROGRAMS BRANCH TRANSFERRED

The administrative functions of the Special Programs Branch, Supply Service, Office of the Surgeon General, Washington 25, D. C., have been transferred to the Army Medical Purchasing Office, 52 Broadway, New York. The programs under the Special Programs Branch are (1) Optical Program (Spectacles), (2) Artificial Eye Program, (3) Arch Support Program, (4) Books and Journals Program.

ARMY SPECIALIZED TRAINING PROGRAM UNITS

Army Service Forces Circular No. 35 states that the provisions of ASF Circular No. 159, dated Dec. 23, 1943, which provide for instruction in "Control of Malaria and Malaria Discipline" at Army Service Forces schools, are not applicable to Army Specialized Training Program Units.

MISCELLANEOUS

HOSPITALS NEEDING INTERNS
AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their house staff quotas allotted by the Procurement and Assignment Service:

(Continuation of list in *THE JOURNAL*, February 26, p. 582)

IOWA

Broadlawns Polk County Hospital, Des Moines. Capacity 295; admissions, 3,811. T. P. Sharpnack, Administrator (2 interns—October 1).

NEW JERSEY

Hackensack Hospital, Hackensack. Capacity 250; admissions, 9,353. Mary Stone Conklin, R.N., Superintendent (interns—October).

OHIO

Aultman Hospital, Canton. Capacity 150; admissions, 6,332. James W. Stephan, Director (3 interns).

St. Mary's Hospital, Cincinnati. Capacity 200; admissions, 4,881. Sister Theonilla, Superintendent (3 interns).

PRIORITY RATINGS FOR PAPER
CUPS AND CONTAINERS

The executive director of the Paper Cup and Container Institute, New York, stated that because of the acute shortage of paper cups and containers the War Production Board has amended Direction 2, Priorities Regulation No. 3, to include other essential users of paper service. Welfare organizations are permitted under this amendment to apply priority ratings to orders for the feeding of service men and their guests. The amendment also provides for persons engaged in serving passengers on trains and planes. It also enables hospitals to apply priority ratings to orders for serving all patients instead of restricting it to patients in contagious wards and employees, as formerly. Use of hot drink cups for cold food and beverages is prohibited under the amendment, and therefore only hot food and beverages can be served in hot drink cups and containers. By serving cold drinks and food in cold cups and containers, considerable time and paper is conserved, as they require less time to produce and use less paper. The use of paper cups with individual bottled beverages also is prohibited. No persons, except in the case of military exchanges or service departments, may apply for the purchase of paper cups or food containers under blanket MRO ratings if he did not use such cups and containers before Oct. 29, 1943. However, plants, hospitals and concessionaires desiring to open new "in plant" feeding operations may apply for preference ratings to obtain supplies of paper cups and food containers on form WPB-541 which formerly was PD-IA. The amendment order dated Jan. 29, 1944 will continue until May 1, 1944 unless previously extended.

MEDICAL NEGLECT AMONG NETHERLANDS
WORKERS FORCED TO LABOR IN
GERMAN WAR PLANTS

Recent reports from the Netherlands Information Bureau indicate that many Netherlands workers forced to labor in German war plants have been stricken with dysentery, scarlet fever and typhus. The report stated that there is a serious shortage of doctors in the reich. A Dutch student in Germany published in the Dutch underground paper *DeGuis* (the Beggar) the conditions prevailing in a factory employing 14,000 Netherlands, Polish and Russian workers, in which he stated that one woman doctor was delegated to look after the physical well-being of these 14,000, but that she actually gave but one hour of her time each week for consultations. Three male nurses, however, were on duty every day at this factory who scarcely knew the rudiments of first aid. Whenever these male nurses were unable to cope with an emergency the patient would be sent to a nearby town which had two doctors for its 80,000 inhabitants, the patient often waiting a week or two before being hospitalized. Scarlet fever and diphtheria patients were often placed in wards side by side, with the result that most patients caught both diseases, and instruments were repeatedly used without being sterilized.

LOWER NAVY REQUIREMENTS SET
BY MEDICAL BOARD

The special five man medical commission (*THE JOURNAL*, January 15, p. 166) which President Roosevelt appointed to study physical, mental and moral standards for admission to the armed forces has submitted to the White House a report which recommends that navy eye and teeth requirements be lowered to correspond to those in army general service requirements. The move is expected to have little immediate effect on the nation's three million 4-F's but will improve the general selective service picture by allowing more men to enter the Navy and enabling Selective Service to place more men where they are needed most. It was learned that Selective Service officials have seen the report and that, as a result of its recommendations, the reexamining of a number of 4-F's will be required.

STEEL SCREEN CLOTH FOR CIVILIANS

The War Production Board announced recently that preference ratings of AA-3 or less on civilian purchase orders for steel insect screen cloth are to be disregarded, to provide equitable distribution of this product for civilian use. Such purchase orders are now to be treated as unrated orders. Production of this type of steel screen cloth for civilian use is now at the rate of half of normal yearly production. To effect equitable distribution of this limited output, order L-303 (issued Dec. 13, 1943) required producers to supply civilian needs without regard to the customers' size, location or affiliated outlets. However, some orders carry preference ratings of AA-3 or less and some are unrated, and it was found that this situation seriously interfered with the distribution required by the order. The amendment, issued and effective February 10, remedies this difficulty by placing all civilian purchase orders on the same footing, irrespective of whether they were originally rated AA-3 or less, or unrated.

NEW SYMBOLS FOR WAR GASES

The Chemical Warfare Service of the Office of Civilian Defense, Washington, D. C., recently adopted new symbols for certain chemical warfare agents and instituted symbols for several war gases which previously had no designation. A list of the agents concerned is given herewith with the old and new symbols:

Chemical Warfare Agents	Symbols	
	Old	New
Lewisite	M-1	L
Mustard	HS	H
Mustard-lewisite mixture	MS	HL
Bromobenzylcyanide	CA	BBC
Phenyldichlorarsine	PDA	PD
Arsine		SA
Cyanogen chloride		CC
Hydrogen cyanide		AC
Nitrogen mustard		HN

DR. WINFORD H. SMITH IS CHAIRMAN
OF MEDICAL SUPPLIES COMMITTEE

The combined Production and Resources Board recently announced the appointment of Dr. Winford H. Smith as American member and chairman of its Medical Supplies Committee. Dr. Smith has been director of Johns Hopkins Hospital, Baltimore, for more than thirty years.

NINTH CIVILIAN DEFENSE REGION

Dr. Ludwig A. Emge, former executive and professor of obstetrics and gynecology, Stanford University School of Medicine, San Francisco, is now serving as Senior Surgeon (R), United States Public Health Service, and has been appointed regional medical officer of the Ninth Civilian Defense Region, Office of Civilian Defense, effective as of Jan. 1, 1944.

ORGANIZATION SECTION

OFFICIAL NOTES

THE CHICAGO SESSION

Railroad and Hotel Reservations

Physicians who expect to attend the annual session of the American Medical Association to be held in Chicago June 12 to 16 should make hotel reservations at the earliest possible time. The demand for hotel accommodations in Chicago is very great. Accommodations can rarely be found unless reservations have been made. A list of Chicago hotels with room rates will be found from time to time in the advertising pages of *THE JOURNAL*, together with a blank form that can be torn out and used for the purpose of applying for hotel reservations. In asking for reservations the hotel of first, second and third choice should be indicated and the kind of accommodations desired should be definitely stated.

While reservations of railroad accommodations cannot be made more than thirty days in advance, it is highly important that such reservations should be made at the earliest possible time and that whenever possible return pullman accommodations should be reserved at the time transportation is purchased at the home station. It may be very difficult to secure return pullman reservations for the desired time after reaching Chicago. In those instances in which return pullman accommodations cannot be secured at the time transportation is purchased at the home station, such accommodations should be applied for at the earliest possible moment after reaching Chicago.

Chicago hotels have many reservations made months in advance, and it may be that in some instances physicians who make hotel reservations for a specified time during the Chicago session will encounter difficulty in retaining their hotel rooms after the time for which their own hotel accommodations have been reserved.

DOCTORS AT WAR

Radio broadcasts of Doctors at War by the American Medical Association in cooperation with the National Broadcasting Company and the Medical Department of the United States Army and the United States Navy are on the air each Saturday at 4:30 p. m. Eastern war time (3:30 Central war time, 2:30 Mountain war time and 1:30 Pacific war time).

The titles and guest speakers for the next three programs are as follows:

March 4. "New Life Preserver."

Speaker, Capt. W. M. Craig (MC), U.S.N.R.

March 11. "Battles Won in Laboratories."

Speaker, A. C. Ivy, Ph.D., M.D., Northwestern University.

March 18. "You Must Help Win This War."

Speaker, Harold A. Vonachen, M.D., Medical Director, Caterpillar Tractor Company, Peoria, Ill.

THE REVENUE ACT OF 1943

PREPARED BY THE BUREAU OF LEGAL MEDICINE AND LEGISLATION

The Revenue Act of 1943 has become a law over the veto of the President. The changes it effects will be applicable to 1944 incomes, and taxpayers must take those changes into consideration when filing their declarations of estimates for 1944 taxes. The date before which these declarations must be filed has been extended from March 15 to April 15. The new law has no effect on the tax due on 1943 income, and physicians may rely on the statement published in *THE JOURNAL*, January 29, for aid in filing the final return for 1943.

Allowances for Dependents and Marital Status.—The new act leaves unchanged the basic tax rates and the credit for marital status and for dependents. Taxpayers may no longer, however, apportion the personal exemption and credit for dependents where a change in status occurs during the year. The new act provides that allowances for personal exemption and dependents must be based on the status of the taxpayer as of July 1. Since the declaration of estimate of tax must be filed by April 15, the status as of that date will initially be determinative. If the status changes before July 1, a revised declaration must be filed to take into consideration the change.

Victory Tax.—The method of determining the victory tax has been modified. Under the previous law that tax was 5 per cent of victory tax net income with a credit allowance dependent on the taxpayer's marital or head of family status. This has been changed so that the rate is a flat 3 per cent of the victory tax net income in excess of \$624 regardless of family status and with no credit allowance.

Earned Income Credit.—The credit of 10 per cent for earned income has been abolished. This change will result in a slight increase in the tax due by the individual taxpayer, but the increase in no case will exceed \$84.

Deductibility of Excise Taxes.—Formerly the taxpayer was permitted to deduct certain excise taxes, such as taxes on theater tickets, use tax on automobiles and boats, stamp taxes, taxes on club dues, telephone calls and so on. Such deductions may still be claimed in connection with taxes for 1943 but are

not permitted in connection with the declaration of estimate for 1944 taxes. If any of the excise taxes, however, fall in the category of trade or business expenses or are necessitated in connection with the production or collection of income or the management, conservation or maintenance of property held for the production of income they may still be deducted.

Special Deduction for the Blind.—A special deduction of \$500 for blind persons is authorized. A blind person is defined as one whose central visual acuity does not exceed 20/200 in the better eye with correcting lenses or whose visual acuity is greater than 20/200 but is accompanied by a limitation in the fields of vision such that the widest diameter of the visual field subtends an angle no greater than 20 degrees. Status for the deduction will be determined as of July 1 of the taxable year.

Underestimated Tax.—The penalty for substantially underestimating taxes has been modified in several respects. As the change applies to the declaration to be filed on or before April 15, if the taxpayer bases his estimate on anticipated income as large as his 1943 income, no penalty attaches even though the final return for 1944, to be filed on or before March 15, 1945, discloses a substantial underestimate.

Returns by Exempt Organizations.—Many organizations exempt from the payment of income taxes under section 101 of the Internal Revenue Code will be required to file annual returns with the Bureau of Internal Revenue. This requirement is applicable to taxable years beginning after Dec. 31, 1942. The date before which such returns must be filed is not fixed in the law. It is not contemplated that such exempt organizations will be taxed at the present time, but the informational return must contain the items of gross income, receipts and disbursements, and such other information as the Commissioner of Internal Revenue, with the approval of the Secretary of the Treasury, may by regulation prescribe. Such organizations too must keep such records, render under oath such statements, make such other returns and comply with such

rules and regulations as the commissioner with the approval of the secretary, may from time to time prescribe.

No such annual return need be filed by any organization exempt from taxation under the provisions of section 101—

(1) which is a religious organization exempt under section 101 (6); or

(2) which is an educational organization exempt under section 101 (6), if such organization normally maintains a regular faculty and curriculum and normally has a regularly organized body of pupils or students in attendance at the place where its educational activities are regularly carried on; or

(3) which is a charitable organization or an organization for the prevention of cruelty to children or animals exempt under section 101 (6), if such organization is supported in whole or in part by funds contributed by the United States or any state or political subdivision thereof or is primarily supported by contributions of the general public; or

(4) which is an organization exempt under section 101 (6) if such organization is operated, supervised or controlled by or in connection with a religious organization entitled to exemption under that section; or

(5) which is an organization exempt solely under section 101 (3), relating to fraternal beneficiary societies, orders or associations; or

(6) which is an organization exempt under section 101 (15) if such organization is a corporation wholly owned by the United States or any agency or instrumentality thereof, or a wholly owned subsidiary of such a corporation.

Social Security Taxes.—The tax on employers and employees under the Federal Insurance Contributions Act will remain at 1 per cent until Jan. 1, 1945.

Increase in Postal Rates.—The new act increases for the duration of the war and for six months thereafter certain postal rates. These increases will become effective thirty days after the enactment of the act (February 25). The rate on first class mail for local delivery is changed from 2 cents to 3 cents per ounce, on air mail from 6 cents to 8 cents per ounce, for money orders from 6-22 cents per order (depending on the amount) to 10-37 cents an order, on registered mail from 15 cents-\$1 per article to 20 cents-\$1.35 per article, on insured mail from 5-35 cents per article to 10-70 cents per article and on C. O. D. mail from 12-45 cents per article to 24-90 cents per article. Furthermore the rate on fourth class mail will be increased by an amount equal to 3 per cent of the previous rate, or by 1 cent, whichever is the greater. If the 3 per cent amount results in a fraction or part of a cent, such fractional part will be disregarded unless it amounts to one-half cent or more, in which case it will be increased to 1 cent.

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status.—H. R. 149 has passed the House and Senate, proposing to fix a reasonable definition and standard of identity of certain dry milk solids. H. R. 3687, the Revenue Act of 1943, has become a law over the veto of the President. It repeals the earned income credit, provides a special deduction of \$500 for blind persons, freezes the tax on employers and employees under the Federal Insurance Contributions Act at 1 per cent until Jan. 1, 1945, changes the method of determining the victory tax by establishing a flat rate of 3 per cent with no credit allowance, denies the deductibility of certain federal excise taxes, imposes on many organizations exempt from the income tax law the duty of filing annual information returns and effects other changes that taxpayers must take into consideration in filing their declarations of estimated tax on or before April 15.

Bills Introduced.—S. 1726, introduced by Senator Davis, Pennsylvania, proposes an appropriation of \$5,000,000 to enable the Administrator of Veterans' Affairs to provide seeing-eye dogs for blind veterans who are entitled to disability compensation under the laws administered by the administrator. H. J. Res. 241, introduced by Representative Judd, Minnesota, would request the President to approach the governments of opium-producing countries throughout the world, urging on them in the interest of protecting American citizens and those of our allies and of freeing the world of an age-old evil, that they take immediate steps to limit and control the growth of the opium poppy and the production of opium and its derivatives to the amount actually required for strictly medicinal and scientific purposes. H. R. 4270, introduced by Representative Brooks, Louisiana, proposes an appropriation of \$3,000,000 to construct a veterans' hospital in northwest Louisiana, near Shreveport, for the accommodation of approximately 2,000 bed patients.

STATE MEDICAL LEGISLATION

New Jersey

Bills Introduced.—S. 101 proposes so to amend the uniform narcotic drug act as to include "isonipocaine" within the definition of a narcotic drug. The bill proposes specifically to define isonipocaine as "the substance identified chemically as 1-methyl-4-phenyl-piperidine-4-carboxylic acid ethyl ester, or any salt thereof by whatever trade name identified." A. 61 proposes to provide for the establishment and administration of a plan for providing compensation to covered workers to be paid them when they lose time from work because of sickness.

New York

Bills Introduced.—S. 867 proposes to authorize a temporary state commission to "make such studies, surveys and investigations as it may deem necessary and proper in connection with the proposal to the governor and the legislature of programs for medical care for persons in the state of New York and to make such proposals." S. 868 proposes to continue to March 31, 1945 the temporary state commission created by chapter 682 of the laws of 1938 to formulate a long-range state health program. A. 1303, to amend the public health law in relation to the examination or quarantine of persons suspected of venereal disease, proposes that if any such infected person refuses to submit to the required examination or to permit specimens of blood or bodily discharges to be taken for laboratory examination or to comply with the restrictions imposed by quarantine the appropriate health officer may apply to a justice of the supreme court or a county judge for an order compelling compliance. The bill also proposes to authorize the local or district state health officer to require any person within his jurisdiction who is found to be infected with a venereal disease in a state which is or may become communicable to submit to such treatment or quarantine, or both, as may be necessary to terminate the communicable stage.

Virginia

Bills Introduced.—S. 219, to amend the laws relating to venereal diseases, proposes (1) to require health officers to investigate all cases of lymphogranuloma inguinale or granuloma inguinale, as well as syphilis, gonorrhea and chancroid, as the present law provides, within their territorial jurisdiction; (2) to authorize health officers to require persons suspected of being infected with any of the venereal diseases just mentioned to submit to examination; and (3) to make it a misdemeanor for any person found infected with any of the venereal diseases mentioned to fail or refuse to take the treatment prescribed by a competent physician or to fail to continue a treatment until cured. S. 234 proposes to prohibit the retail sale or distribution, except on the prescription of a doctor of medicine, dentist or veterinarian, of hormones, or hormone drug preparations, whether of natural origin, prepared from the so-called glands of internal secretion or endocrine glands, or whether synthetically produced, by whatsoever trade name or designation, or any compound or mixture thereof.

Bill Passed.—H. 271 passed the House of Delegates, February 24, proposing so to amend the medical practice act as to provide that the board of medical examiners consist of nine regular physicians, one homeopath and one osteopath.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ALABAMA

Personal.—Dr. William D. Lyon has resigned as pediatric consultant to the bureau of maternal and child health of the state department of health to enter private practice in Andalusia.

Birmingham Chosen for New Medical Site.—Birmingham has been selected as the site for the new Medical College of Alabama, to operate as a part of the University of Alabama, University. Committees have been working on the selection of the proper site since the enactment of a bill last year which appropriates a million dollars for land, buildings and equipment and \$366,750 for each of the fiscal years ending Sept. 30, 1944 and Sept. 30, 1945 (THE JOURNAL, June 26, p. 629). On January 21 newspapers reported that Birmingham offered the state the Hillman Hospital in addition to an adjacent tract of land.

CALIFORNIA

Dr. Markee Goes to North Carolina.—Joseph E. Markee, Ph.D., professor of anatomy, Stanford University School of Medicine, San Francisco, has been made professor and head of the department of anatomy at Duke University School of Medicine, Durham, N. C. Dr. Markee received his doctor of philosophy degree at the University of Chicago in 1929 and has been associated with Stanford since that time.

FLORIDA

Dr. Sowder Transferred to War Shipping Administration.—Wilson T. Sowder, P. A. Surg., U. S. Public Health Service, who had been lent to the state board of health to serve as acting director of the bureau of local health service, has been transferred to the War Shipping Administration. Newspapers report that he will be venereal disease control officer for the merchant marine service.

INDIANA

Milk Produce Cause of Typhoid Epidemic.—Cheese or butter produced by the Sanitary Dairy Company of Peru is said to be the cause of the typhoid epidemic in north central Indiana which involved at least 175 cases of the disease and six deaths. In a statement to the press, Dr. Thurman B. Rice, Indianapolis, acting state health director, stated that no responsibility for the epidemic is attached to the present owners of the company who took possession January 1 and who have not made any butter or cheese since that date. It was stated that the original source of the typhoid bacillus may have been a carrier working in the plant or supplying the plant. The suspected products were sold under the trade names of "Sanitary Cheese" or "Peru Sanitary Butter." Persons who have cheese or butter in their iceboxes that would come under the present description should determine from their grocer whether the product may have come from this company. If so, it should be destroyed. Grocers and meat dealers who may have any of this butter or cheese on their counters are ordered not to sell it.

KENTUCKY

Dr. Pritchett Named President of State Association.—Dr. James H. Pritchett, Louisville, was recently elected by the council of the Kentucky State Medical Association as president of the association to succeed the late Dr. Van A. Stilley, Benton. Dr. Pritchett is associate clinical professor of pediatrics at the University of Louisville School of Medicine.

MICHIGAN

Personal.—Dr. Douglas H. Fryer, formerly director of the Bay City-County Health Department, is now field medical director and assistant director of the bureau of local health services of the Michigan Department of Health, Lansing.—Dr. Ivor D. Harris has been appointed acting director of the department of radiology at Wayne University College of Medicine, Detroit. Dr. John C. Kenning, director of the department, is on leave of absence on account of ill health. During Dr. Kenning's absence Dr. Harris holds the rank of instructor in radiology.

Physician Convicted for Conspiracy to Spy.—Dr. Fred William Thomas, Detroit, was convicted February 24 by a federal court jury of conspiracy to spy for Germany, newspapers report. Dr. Thomas was accused with seven others of conspiring to obtain information to be transmitted to Germany. Six co-defendants pleaded guilty. A seventh was discharged. In the case of Dr. Thomas, the jury recommended leniency, it was stated. Government attorneys had not asked for imposition of the death penalty, and the maximum imprisonment possible under the statute would be thirty years.

MINNESOTA

Red Cross, Military Personnel and Civilians Cooperate in Hospital Strike.—Red Cross, local military personnel and civilian volunteers cooperated in caring for patients at the University of Minnesota Hospitals, Minneapolis, in January when service employees of the university went on strike. On January 14, the day after the strike was called, 46 civilian patients were discharged, and 14 army patients transferred to the station hospital at Fort Snelling. Three patients, considered as "acute emergencies," were admitted to the hospital during the day. On January 15, nine service employees of the hospital were on duty out of a normal staff of more than 150. An army cook on leave volunteered his services and, with navy cooks and civilian volunteers, prepared the meals for the patients. Red Cross aides assisted in the preparations for cooking and serving meals. It was announced, January 16, that members of the Public Building Service Employees Union 113, which had declared the strike against the university, had recommended that hospital employees return to their work. This was accomplished and the following day reports indicated that the maintenance of the hospital was operating along normal lines. On January 20, after an agreement between the union and the board of regents of the university, newspapers announced that the functioning of the university was proceeding smoothly.

Licenses Revoked.—The Minnesota State Board of Medical Examiners on Dec. 16, 1943 revoked the license to practice medicine of Dr. Walter D. Hammond, Minneapolis. The physician had been charged with "immoral, dishonorable and unprofessional conduct" in that he permitted two unlicensed persons, A. A. Morgan and C. C. Morgan, associated with him in the practice of medicine at the Health Institute, 106 Washington Avenue South, Minneapolis, to examine, diagnose and render treatment to one Ernest Anderson, Hastings. The patient died on Aug. 24, 1943 of malignant teratoma of the testicle with pulmonary metastasis. Dr. Hammond was also charged with having failed to take the necessary and proper steps to diagnose the ailment correctly and with failing to render proper treatment for the condition. It was also alleged that "a grossly exorbitant fee of approximately \$1,250" was charged Anderson, including \$485 for "capsules which were of no value whatsoever" in the treatment of cancer. It was also alleged that because of the unlawful and dishonorable conduct on the part of Dr. Hammond "every chance for the ultimate recovery" of the patient was destroyed. At the hearing Dr. Hammond admitted that he had examined Anderson but denied making a diagnosis of "hydrocele," which had been the diagnosis rendered at the institute, it was stated. He also claimed that he had seen Anderson on only one occasion. He admitted that he had been associated for a number of years with the two Morgans but disclaimed responsibility for their acts. He further testified that he neither owned the Health Institute nor did he pay rent on the space occupied by him. On cross examination he admitted that he received only such share of the proceeds of the Health Institute as was allotted to him by the Morgans. During the investigation and prior to the hearing, A. A. Morgan committed suicide.—On Dec. 16, 1943 the Minnesota State Board of Medical Examiners also revoked the license to practice medicine of Dr. O. H. Bakke, Minneapolis. Dr. Bakke's license had been suspended April 10, 1943, for a period of five years for issuing 136 narcotic prescriptions to 4 persons. Notwithstanding the fact that Dr. Bakke has no lawful right to continue to practice medicine, an investigation by the Federal Bureau of Narcotics and the Minnesota State Board of Medical Examiners disclosed that Dr. Bakke was continuing to practice medicine from his home and had issued 4 narcotic prescriptions to one G. F. Lambert between Oct. 24 and Nov. 1, 1943. There was also evidence that Dr. Bakke, three days before the board hearing, issued a narcotic prescription to another person.

MISSOURI

Dr. Barry Wood III with Typhus.—Dr. William Barry Wood Jr., Clayton, Busch professor of medicine and head of the department at Washington University School of Medicine, St. Louis, is reported to be convalescing from endemic typhus. According to the *St. Louis Post-Dispatch*, Dr. Wood is one of two persons reported to be ill with the disease in St. Louis. It was stated that both contracted the mild murine form of typhus.

Physician Sentenced for Illegal Narcotics Sale.—Dr. Fred A. Stahl, Springfield, was sentenced to two years in prison in federal court, January 28, newspapers report. Judge Albert L. Reeves declared that the sentences on the two counts on which the physician was convicted by a jury January 26 for the illegal sale of morphine were to run concurrently. Defense Attorney William L. Vanderverter immediately gave notice of appeal and was allowed ninety days in which to complete all filings. Dr. Stahl graduated at Harvard Medical School, Boston, in 1921.

NEW YORK

Dr. Craig Retires from State Service.—Dr. Walter J. Craig, Albany, director of the division of orthopedics of the state department of health, has retired from state service, effective February 1, to devote his entire time to the private practice of orthopedic surgery. He joined the state department of health in 1927 as orthopedic surgeon, becoming director of the division the following year.

New York City

License Reinstated.—The license of Dr. Samuel H. Kauffman, Brooklyn, revoked Nov. 23, 1933, has been reinstated by the state board of medical examiners, effective February 3.

New Administrator Named for Hospital Department.—Mr. Harry Sesan, vice president, Associated Hospital Service of New York, has been named in charge of the administrative activities of the hospital department of the service. He succeeds the late Dr. Paul Keller.

Annual Graduate Fortnight.—"Infections and Their Treatment" will be the theme of the annual graduate fortnight of the New York Academy of Medicine, October 9-20. Special emphasis will be placed on the more recent chemotherapeutic agents. The fortnight, as in the past, will include morning panel discussions, afternoon hospital clinics, evening lectures and pathologic demonstrations. There will also be a scientific exhibit, including the more recent pharmaceuticals and an appropriate library exhibit. Additional information may be obtained from the Committee on Medical Education, New York Academy of Medicine, 2 East 103d Street, New York 29.

NORTH CAROLINA

Personal.—Dr. William Ross Cameron, Portsmouth, Va., has been appointed health officer for Charlotte, effective March 1.—Dr. John L. B. Ward, Asheville, has been elected a member of the state board of medical examiners to fill the unexpired term of the late Dr. Lewis W. Elias, Asheville.

Winners of Student Awards.—Dr. William W. Shingleton in the Bowman Gray School of Medicine of Wake Forest College, Winston-Salem, was awarded first prize of \$25 in a group of prizes inaugurated recently by the *Journal* of the Bowman Gray School of Medicine in its effort to recognize outstanding student papers. The title of Dr. Shingleton's paper was "The Etiological Aspects of Hyperthyroidism," published in the September issue of the *Bowman Gray Journal*. Second prize of \$15 went to Robert R. King Jr., fourth year student, for his work on "The Preclinical Student and Oncology," published in the March issue, and third prize to Dr. Moses Edward Rice Jr., for his paper on "A Physiological Interpretation of the Clinical Changes in Sprue," published in the November issue. The prizes are to be awarded annually, the selections to be made by a group of judges representing members of the medical school faculty.

OHIO

Morris Memorial Lecture.—Dr. Louis Hamman, associate professor of medicine, Johns Hopkins University School of Medicine, Baltimore, will deliver the Roger S. Morris Memorial Lecture, March 7, in the auditorium of the University of Cincinnati College of Medicine. His subject will be "The Diagnostic Implications of Aortic Insufficiency."

OKLAHOMA

Changes in the Faculty.—Arthur A. Hellbaum, Ph.D., associate professor of physiology, University of Oklahoma School of Medicine, Oklahoma City, has been named professor of pharmacology and acting chairman of the department. Dr. John W. Cavanaugh, who was recently appointed assistant professor of surgery, has now been named full time professor of surgery at the medical school.

PENNSYLVANIA

Personal.—Dr. James D. Lewis, Scranton, has been appointed health director of Lackawanna County, succeeding Dr. William T. Davis, Scranton.

Philadelphia

Charles Jenks Pilling Dies.—Charles Jenks Pilling, president of the George P. Pilling and Son Company, died February 1.

Hospital News.—A urology room has been added to the surgical suite of the Hospital of the Woman's Medical College of Pennsylvania through a gift of Mr. William Goldman. Under the supervision of the department of urology, the new unit is outfitted with modern surgical and x-ray equipment for both diagnostic and therapeutic procedures and for teaching.

Physician Creates Hospital Memorial.—Dr. Louis Schwarz, who died December 17 in Mount Sinai Hospital, where he had maintained a residence since ill health forced his retirement in 1936, bequeathed to the hospital his \$45,000 estate. The fund will be known as the Albert and Nanni Schwarz Memorial Fund of Mount Sinai Hospital and will be a memorial to the parents of Dr. Schwarz.

Dr. Pearson Resigns as Medical Dean.—Dr. William A. Pearson has resigned as dean of Hahnemann Medical College and Hospital of Philadelphia, a position he held since 1913. Dr. Pearson will continue as professor and head of the department of chemistry. William G. Schmidt, Ph.D., has been named acting dean. Dr. Pearson graduated at Hahnemann in 1915. He had been named professor of chemistry in 1906.

Personal.—Dr. Josephine C. Lawney, dean of the Woman's Christian Medical College and medical director of the Margaret Williamson Hospital in Shanghai before the beginning of the war with Japan, was a guest of the Woman's Medical College of Pennsylvania recently. Dr. Lawney returned to the United States on the *S. S. Gripsholm* in December.—Dr. Hobart A. Reimann, Magee professor of practical medicine and clinical medicine, Jefferson Medical College of Philadelphia, visited Puerto Rico in December as guest of the Puerto Rico Medical Association in San Juan, where he gave several lectures on acute infectious diseases.

TENNESSEE

Personal.—Dr. Solomon J. Axelrod has resigned as director of the division of preventable diseases of the Chattanooga and Hamilton County Department of Health to accept a commission as passed assistant surgeon in the U. S. Public Health Service.—Dr. William L. Phillips, who was recently placed on inactive duty after seventeen months in the army medical corps, has been named director of the Obion-Lake health district. He succeeds Dr. George W. James, who, it is reported, has accepted a position with the New York State Department of Health.

TEXAS

Personal.—Lewis C. Robbins, P. A. Surgeon, U. S. Public Health Service Reserve, formerly health officer of Wichita Falls, was presented with the distinguished service award of the United States Junior Chamber of Commerce on January 14. Dr. Robbins was cited for his successful conduct of a venereal disease control campaign that he instituted in Wichita Falls. He is now associated with the public health department in San Antonio.—Dr. Joe D. Nichols was chosen president of the Atlanta Chamber of Commerce, January 14.

Dr. Stuart Wallace Chosen Recipient of New Professorship.—Dr. Stuart A. Wallace, chairman of the department of pathology, Baylor University College of Medicine, Houston, is the first incumbent of the newly created Fulbright professorship of pathology. The professorship was endowed at Baylor University under a contract executed between Mrs. Irene Fulbright, widow of R. C. Fulbright of Houston and Washington, and the Houston executive committee of the board of trustees of Baylor University (*THE JOURNAL*, February 26, p. 587).

University News.—Frank M. Stead, Ph.D., associate professor of sanitation, University of Texas School of Medicine, Galveston, has resigned to take charge of studies on industrial hygiene for the California State Department of Public Health at Berkeley. Joe B. Winton has been appointed associate professor of sanitation to succeed Dr. Stead. J. Allen Scott, Sc.D., senior statistician in the division of vital statistics of the United States Bureau of Census and formerly with the Rockefeller Foundation in Egypt, has been appointed as associate professor of preventive medicine in the special field of statistics and epidemiology.

UTAH

Physician Honored.—Dr. Preston G. Hughes, Spanish Fork, was awarded the distinguished service award, January 19, at the annual banquet, honoring the young man of junior chamber of commerce age who renders the most notable civic service during the year. In presenting the award John E. Booth, chairman of the committee, stated that Dr. Hughes had given freely of his time and energy in examining local inductees at the local service board as well as making a number of other contributions to civic service.

WEST VIRGINIA

Changes in Health Officers.—Dr. Ward L. Oliver, Cobleskill, N. Y., has been appointed health director of district 3 with headquarters at Point Pleasant. He succeeds Blinn A. Buell, Surgeon, U. S. Public Health Service, who has been transferred to another state. The district is composed of Jackson, Mason, Putnam and Roane counties. —Dr. John W. Gilmore, Wheeling, has been named director of the city-county health department in Wheeling to succeed Dr. Andrew J. Nicholas, resigned.

Dr. Gerhardt Named to Head New Cancer Control Division.—Dr. Paul R. Gerhardt, director of the bureau of medical services in the department of public assistance at Charleston, has been appointed by Dr. John E. Offner, state health commissioner, as director of the new division of cancer control. The appointment was made under the provisions of an act passed at the 1943 session of the legislature. The act authorizes the commissioner to appoint the director in consultation with the public health council. The division is authorized to set up cancer diagnostic and treatment clinics in hospitals meeting certain standard minimum requirements. In the establishment and operation of such clinics the division is to consult and cooperate with the West Virginia State Medical Association. Free diagnostic service and treatment are to be furnished needy patients within the limits of funds available for the purpose. The bill creating the division was signed March 19, 1943. With the appointment of Dr. Gerhardt as director, it is now thought that the division will be in full operation within a few weeks. An appropriation of \$10,000 per annum for the use of the division was made by the legislature in 1943. Dr. Gerhardt has served as head of the bureau of medical services for the past two years. As such he has directed the department programs for crippled children and adult physical rehabilitation. Prior to that time he was engaged in industrial practice at Van, Boone County. He is a graduate of the University of Wisconsin Medical School, Madison, and was licensed in West Virginia in 1938.

WISCONSIN

Personal.—Dr. Willard C. Sumner was recently appointed health officer of Edgerton, succeeding Dr. George F. Burpee, who entered the navy. —Dr. George D. Reay, Onalaska, has been appointed coroner of La Crosse County and Dr. Lewis A. Moore has been named health officer of Monroe to succeed Dr. Clarence E. Baumle, who resigned, effective January 1.

Meeting of Trudeau Society.—The Wisconsin Trudeau Society will meet at the Lake View Sanatorium, Madison, March 11. Among the speakers will be:

- Dr. Earl E. Carpenter, Hawthorne, Respiratory Hazards of Electric Welding.
 - Dr. Allan A. Filck, Madison, Case Finding Among Industrial, Non-industrial and Institutional Groups.
 - Dr. Florence E. MacInnis, Milwaukee, Significant Data on Tuberculosis in Milwaukee During 1943.
 - Dr. Kenneth G. Bulley, Aurora, Ill., Short Term Pneumothorax.
 - Dr. Frank L. Jennings, Indianapolis, Aims and Accomplishments of American Trudeau Society Committee on Undergraduate Medical Education.
 - Dr. James M. Willie, Madison, Thoracoplasty in Some Advanced Cases of Tuberculous Bronchitis.
 - Dr. David D. Feld, Wauwatosa, Significance of Tubercle Bacilli in Fasting Gastric Contents.
 - Dr. Helen A. Dickie, Madison, Some Problems in the Differential Diagnosis of Pulmonary Tuberculosis and Atypical Pneumonia.
- Dr. John D. Steele Jr., Milwaukee, is secretary of the Wisconsin Trudeau Society.

ALASKA

New Secretary of Medical Board.—Dr. William M. Whitehead, Juneau, has been appointed to the Alaska Board of Medical Examiners and elected secretary-treasurer to fill the vacancy created by the death of Dr. Walter W. Council, who at the time of his death on Nov. 13, 1943 was the secretary-treasurer. Dr. Leonard P. Dawes, Juneau, is president of the board, and other members are Drs. LeRoy W. Flora, Anchorage; Arthur J. Schaible, Fairbanks, and Thomas Morcom, Nome. Regular meetings of the board for examinations are held on the first Tuesday of March and the first Tuesday of September each year at Juneau.

HAWAII

Personal.—Dr. C. Alvin Dougan, Honolulu, has resigned as director of the tuberculosis bureau of the Territory of Hawaii Board of Health, newspapers report. He had held the position for ten years. —Dr. Aaron Sumner Price, New York, has been appointed director of laboratories at the Queen's Hospital, Honolulu.

GENERAL

Election of Officers.—Dr. Cobb Pilcher, Nashville, Tenn., was named president-elect of the Society of University Surgeons at its meeting in Nashville, February 12, succeeding Lieut. Col. Franklin E. Walton, M. C., U. S. Army. Dr. Alexander Brunschwig, Chicago, was installed as president of the society. Dr. Frederick E. Kredel, Charleston, S. C., was chosen treasurer to succeed Dr. Pilcher. The 1945 meeting will be held in New York.

Outwitting Handicaps.—Copies of *Outwitting Handicaps*, a bimonthly magazine intended to assist in the rehabilitation of the handicapped, have recently been made available to military and veterans' hospitals in the United States. The publication presents ideas and suggestions by persons handicapped themselves to assist others in overcoming physical disabilities. The publication is the official organ of "We, The Handicapped, Inc.," a noncommercial fraternal publication founded on the law of human helpfulness. Harry Ernest Smithson is the editor, and Rose D. Meyer associate editor. The address is 15327 Weland Avenue, Detroit 21.

First Ciba Award.—The first Ciba Award, established for outstanding work in endocrinology, is now available. The prize of \$1,200 was established by the Ciba Pharmaceutical Company in 1943, the selection of the recipient to be made by the Association for the Study of Internal Secretions. It will be given to an investigator in the field of endocrinology, not more than 35 years of age, whose work may be in the field of either preclinical or clinical endocrinology. If the recipient should choose to use the award toward further study in a laboratory other than that in which he is at present working, the award will be increased to \$1,800. The option is left entirely to the recipient. Nominations for 1944 are now invited and should be sent in as soon as possible to Dr. Henry H. Turner, 1200 N. Walker Street, Oklahoma City. They should be accompanied by a list of publications and five reprints if possible.

The Richard Pearson Strong Medal.—On February 28 the first award of the Richard Pearson Strong Medal was made to the man for whom it was named, Dr. Strong, professor of tropical medicine emeritus, Harvard Medical School, Boston. Presentation of the first award was made by Rear Admiral Edward R. Stitt (MC) retired, former surgeon general of the U. S. Navy. The award was established by the Winthrop Chemical Company and will be presented through the American Foundation for Tropical Medicine. It will consist of a palladium medal and a cash honorarium of \$500. The medal will bear the name and profile of Dr. Strong, who has devoted his career to tropical medicine. Dr. Strong, who graduated at Johns Hopkins University School of Medicine, Baltimore, in 1897 was in 1899 appointed president of the first board for the investigation of tropical diseases in the Philippine Islands and shortly afterward organized the Philippine Government Biological Laboratory in Manila. In 1907 he was appointed professor of tropical medicine at the University of the Philippines College of Medicine and Surgery, a position he held until 1913, when he joined Harvard Medical School in a similar capacity, holding the latter appointment until 1938, when he became emeritus professor. In 1941 Dr. Strong was appointed consultant to the Secretary of War on tropical medicine and at present is on active duty as colonel, medical corps, Army of the United States, director of tropical medicine at the Army Medical School, Washington, D. C., in charge of the instruction of medical officers in tropical medicine.

Cushing Society Publishes Journal.—The Harvey Cushing Society, which recently extended its membership to become a national organization for neurologic surgeons, has begun the publication of a journal to be known as the *Journal of Neurosurgery*. Number one will appear with the February issue. Dr. Louise C. Eisenhardt, New Haven, Conn., will be the managing editor. The editorial board will be composed of Dr. Gilbert Horrax, Boston, chairman; Capt. Winchell M. Craig (MC), U. S. Naval Reserve, Dr. Kenneth G. McKenzie, Toronto, Ont., Lieut. Col. Roy Glenwood Spurling, M. C., A. U. S., and Dr. A. Asenjo, Santiago, Chile. The first meeting of the Harvey Cushing Society was in 1932. Originally organized by pupils and close associates of the late Dr. Cushing, the organization a few years ago changed its constitution and by-laws to permit the admission of members throughout the country who are interested in neurologic surgery and who have been recognized by the specialty boards. Membership has been designated corresponding, honorary and active, the last group to consist of neurologic surgeons, neurologists, neuroanatomists, neuro-ophthalmologists, neuropathologists, neurophysiologists, psychiatrists, psychologists, roentgenologists and other scientists whose work bears on neurologic surgery. The new constitution stipulated that the number of nonsurgical members shall not be more than one third of the total membership. The highlight of the original group's activities was the celebration in 1939 of the seventieth birthday of Dr. Harvey Cushing. At this time the society presented to him a copy of A Bibliography of the Writings of Harvey Cushing prepared for the occasion. At the time of his death in 1939 Dr. Cushing was emeritus professor at Yale University School of Medicine, New Haven. Officers of the Harvey Cushing Society are Dr. Edgar F. Fincher, Atlanta, Ga., president, Lieut. Comdr. William J. German (MC), U. S. Naval Reserve, vice president, and Dr. Eisenhardt, secretary-treasurer. The society has recognized the importance to neurologic surgery of the related branches such as neurophysiology, neuroroentgenology and neuro-ophthalmology and it is anticipated that these related fields as well as neurologic surgery will find a channel for expression in the new journal.

CANADA

Canadian Medical Association.—The seventy-fifth annual meeting of the Canadian Medical Association will be held in Toronto, May 22-26. In a preliminary announcement the *Canadian Medical Association Journal* states that the association reported the largest membership in its history in 1943, 7,578, including 2,472 in military service, a gain of 608 over the year of 1942 and a gain of 3,577 since the war.

LATIN AMERICA

Health Activities in Latin America.—Physicians Launch Benefit Program.—The organization of the "Mexican Mutual Institute of National Medical Progress" has been announced. The movement started with the Confederation of Medical Associations of the Mexican Republic and the Association of Medical Surgeons of the Federal District. Seventy-three drug houses in Mexico City agreed to donate \$30,000 to launch the project, promising similar contributions annually. The remainder of the finances necessary are expected to come from the monthly premiums charged members. The program aims to award benefits for old age, invalidism and death as well as to grant assistance to medical colleagues carrying on promising research or who are in need of funds for postgraduate education. The idea stemmed from the "plight of many physicians who, when death, old age or an accident occurs, cannot count on guaranteed protection for themselves and their families." It is pointed out that the support allotted by the private laboratories and drug manufacturers does not in any way carry with it any obligation on physicians to prescribe any particular product. Initially the service will take in twenty-three medical societies in the republic as well as any individual physicians who wish to join. Scholarships will be given for study abroad and support will be offered to research. The institute's capital will be deposited in a bank, and funds will be withdrawn only with the approval of the three sections composing a tripartite directorate representing private practitioners, physicians engaged in group practice and delegates from cooperating laboratories.

Febrical Disease.—The first regional social hygiene conference opened at San Juan the week of January 10 at the School of Tropical Medicine. Dr. Thomas Parran, surgeon general of the U. S. Public Health Service, presented to Dr. Enrique Villela, Mexico City, and Dr. Antonio Fernos-Isern, San Juan, P. R., honorary life memberships in the American Social Hygiene Association. Among the speakers were Dr. Parran;

Dr. William F. Snow, New York, chairman of the executive committee of the American Social Hygiene Association; Elliot Ness, director of the Division of Social Protection of the Community War Services, Federal Security Agency; Dr. Charles E. Shepard, director of personnel training and health education, health and sanitation division, Office of the Coordinator of Inter-American Affairs; Sir Ruppert Briarcliff, medical adviser of the comptroller for the development of welfare of the West Indies and medical adviser for Great Britain to the Anglo-American Caribbean Commission; Dr. Donald W. Huggins of the Trinidad Health Service and Major General Morrison C. Stayer, M. C., U. S. Army, surgeon of the Caribbean Defense Command from Panama. February 9 was designated by executive order of Governor R. G. Tugwell as social hygiene day. Another executive order dated February 2 requires the regular venereal disease tests for all insular government employees within thirty days after the beginning of employment. Either a person found to be infected shall be discharged from employment on direction of the commissioner of health or his continued employment shall be conditioned on his compliance with the prescribed course of treatment. Every official and employee of the government shall be examined for syphilis infection by the department of health after the effective date of the executive order, March 1, and shall be reexamined every eighteen months thereafter during the continuance of his employment by the government. The conference and the executive orders constituted the beginning of a concentrated program against venereal disease in Puerto Rico.

Drug Plant Culture Increasing in Central America.—Information from the Office of the Coordinator of Inter-American Affairs indicates an increased development in drug plant culture in Central America. Six quinine plantations are in cultivation in Guatemala. One of these, "El Porvenir," contains about 1,000 acres of cinchona trees and is the largest in the Western Hemisphere (THE JOURNAL, June 12, 1943, p. 457). Cinchona tree nurseries are in operation in Costa Rica under a program in which the Costa Rican government has agreed to make available 10,000 acres for cinchona cultivation. Development of plantation sources of quinine in both countries is carried on with assistance from United States specialists. El Salvador substantially increased production of balsam. Approximately 50,000 trees are capable of an annual yield of from 300,000 to 500,000 pounds of crude balsam. Nicaragua also is increasing balsam production. The report intimated that other medicinal plants in abundance in Central America will be investigated to determine a justification for use.

New Cinchona Project in Costa Rica.—Plans have been made for the planting of about 100,000 cinchona seedlings by the Inter-American Institute of Agricultural Sciences at Turrialba, Costa Rica, to aid in the development of a quinine-producing industry in Latin America, according to Earl N. Bressman, director of the institute, which was established last year as an inter-American agricultural research and development center. The seedlings destined for planting in Costa Rica are part of 2,000,000 cinchona seeds which were taken out of the Philippine Islands in a flying fortress by Col. Arthur F. Fischer just before the fall of Bataan to the Japanese. Colonel Fischer is now liaison officer of the War Department with the United States Office of Foreign Economic Administration, which is cooperating with the other American republics in the expansion of the cinchona industry in the Western Hemisphere to help replace quinine supplies lost in the Far East. The seedlings are of the high-yielding Ledgeriana type, developed in the Far East from cinchona stock originally brought from South America, the home of the cinchona tree. The seeds have been planted temporarily at the United States government plant station at Glendale, Md., from which they are being distributed to Latin America for the expansion of cinchona planting. The arrangements for the planting of 100,000 seedlings at Turrialba, made in cooperation with the War Department and the Foreign Economic Administration, involve the largest single transplanting resulting from the Philippine stock. Previously a trial lot of 1,000 of the seedlings had been sent to Turrialba. It was stated that the first batch of seedlings had done so well in Costa Rica it is logical to undertake a larger scale operation.

FOREIGN

Nuffield Grant for Plastic Surgery Unit.—The Nuffield Provincial Hospitals Trust has given the University of Oxford £8,000 for ten years toward the cost of establishing and maintaining a plastic surgery unit there. *Science* reports. Dr. Thomas Pomfret Kilner has been made the first director of the plastic surgery unit with the title of Nuffield professor of plastic surgery. Hospital facilities will be provided by the Radcliffe Infirmary, to be supplemented by the Ministry of Pensions, according to *Science*.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Jan. 29, 1944.

All Hospitals to Organize Rehabilitation Services

The Ministry of Health has issued a memorandum on rehabilitation to hospitals. It points out that the experience of the last few years has widened the conception of rehabilitation. Instead of being regarded as an ancillary department of a hospital, confined to a limited group of selected patients, it is now becoming recognized as a form of therapy applicable to almost every type of illness or injury, in lesser or greater degree, and affecting the whole period of hospitalization and convalescence. Experience gained during the war in the treatment of psychiatric disorders shows that under expert guidance much can be done by rehabilitation to restore loss of function.

The full realization of the new conception involves: 1. The introduction of rehabilitation into every ward, adapted to individual complaints and stages of recovery, and commencing on the admission of the patient or as soon thereafter as possible. 2. The planning of convalescence with a view to speeding up the recovery of physical and psychologic function and hastening the return to full activity. Until now convalescence, particularly of hospital patients, has been largely haphazard, and valuable time has been lost which could have been saved by careful planning. 3. Appropriate forms of rehabilitation therapy for nearly all types of inpatient disability and for selected groups of outpatients. Patients with sprained joints, septic hands, chest complaints and similar conditions would recover more rapidly and completely if facilities for rehabilitation were available. 4. The provision of expert supervision throughout the whole period of rehabilitation, and the planning of each patient's day to include the right proportion of suitable activities and rest.

The various activities employed at different stages of rehabilitation include (1) passive physical therapy (heat, massage and electrotherapy), (2) remedial exercises, (3) organized games, both indoor and outdoor, (4) occupational therapy undertaken either in bed or in special departments and consisting of either diversional therapy to distract the patient's attention from his illness or remedial therapy adapted to exercising particular groups of muscles, (5) domestic services, such as ward and kitchen work in the hospital, whose value is chiefly psychologic, (6) lectures and debates, (7) social care and (8) industrial guidance. Clearly the days of "lazing" in the hospital are gone. A woman recovering from pleurisy or an abdominal operation, instead of lying in bed with nothing to occupy her mind except worry about the future of her family, will do exercises and handicrafts designed to prevent weakness and keep up her general health.

Extension of the School Medical Service

A new education bill expands the school medical service, which heretofore has been concerned with medical inspection of school children, determining the level of mental and physical development and referring for special examination and treatment children discovered to have mental or physical defects. Except in certain large school authorities, little provision has been made for treatment, which is left to private practitioners and hospitals. The new bill imposes on local authorities the provision of treatment, other than treatment at home, of all children and young persons attending maintained schools and colleges. This treatment is to be free. Moreover, the benefit of medical services is to be extended to schools which are not maintained. The duties of the school medical officer are con-

siderably extended with regard to the handicapped child. Not only is attendance at special schools made compulsory for children at the age of 5 years, instead of at 7 as heretofore, but parents have the right to ask for special examination of any child over the age of 2. Development of the nursery school will also bring more young children under the care of the school medical officer.

The new bill is a further example of the tendency of the state to control more and more the practice of medicine. The passage of the national health insurance act thirty years ago was a great step in this direction. It provided for the medical treatment by general practitioners of all employed persons earning below \$1,000 annually. In 1941 this income limit was raised to \$1,680. Further extension of the insurance act to the dependents of insured persons was proposed before the revolutionary Beveridge plan was launched. At the lowest estimate this plan provides for the free treatment (apart from insurance payments) of 90 per cent of the population and threatens the extinction of private practice. This probably will not take place at once, but private practice seems likely to diminish as time passes. The whole movement is a manifestation of the socialistic trend in our legislation, which no political party seems willing to oppose. As the changes mentioned show, not even the greatest war in history, involving the most serious peril ever faced by this country, has even temporarily arrested this trend.

Inadequate Food and Medical Supplies in German Prison Camps

At the Royal Society of Medicine two repatriated medical officers, Major J. H. T. Challis and Major G. C. Steele, gave a disturbing account of the food and medical supplies in German prison camps for British soldiers. The food was so poor and scanty, consisting mainly of potato soup, that wounds healed slowly before Red Cross parcels arrived. There was almost complete absence of anesthetics for operations. Complete modern drugs and appliances could not be expected, and there was not even a sufficiency of ether or chloroform or the means for administering them. When the prisoners received the nourishing food in the Red Cross parcels, progress in the healing of their wounds was impressive. The Geneva Convention lays down that the drugs and equipment of hospitals for prisoners must be provided by the belligerent which controls them, but the Germans fail to maintain an adequate standard.

Marriages

CHARLES H. CRONK, Bloomfield, Iowa, to Mrs. Rosamond Skyhawk of Rochester, Minn., in Lancaster, Mo., December 25.

ARTHUR G. BAKER, Grand Rapids, Mich., to Miss Theresa M. Randolph of Port Huron in Ann Arbor, December 18.

CHARLES PORTER BLUNT III, Lynchburg, Va., to Miss Mary Elizabeth Prillaman of Martinsville, December 28.

EDGAR NEWMAN WEAVER, Orange, Va., to Miss Evelyn Dabney Richards of Roanoke, December 20.

JOSEPH SHELTON BOWER, Salem, Va., to Miss Merietta Bagley McGhee of Altavista, December 18.

JOHN H. SHERLOCK, Rock Rapids, Iowa, to Miss Hilda Bergeson in Morton, Minn., January 1.

JAMES T. GIANOULIS, High Point, N. C., to Lieut. Velma Holt at Algiers, Africa, January 31.

WOODROW W. LOVELL, Columbus, Miss., to Miss Carolyn Howell of Atlanta, Ga., January 4.

ROBERT CLARK JONES, New York, to Miss Elizabeth Pitcher of Camden, Maine, January 7.

JAY S. GOODMAN to Miss Fanny Prudowsky, both of Milwaukee, January 21.

Deaths

Harlan Shoemaker ☉ widely known as a leader in the medical profession of southern California, died at St. Vincent's Hospital, Los Angeles, Dec. 11, 1943, following coronary occlusion with a myocardial infarct. Dr. Shoemaker was born at Martelle, Iowa, July 21, 1875. He received his A.B. from Stanford University in 1899 and his M.D. from the University of Pennsylvania Department of Medicine in 1902. Until 1904 he was associated as an intern and resident in surgery with the Methodist Hospital and with the Municipal Hospital in Philadelphia. He practiced in Philadelphia from 1904 to 1910 and then became surgical chief of the Shelby Hospital, Shelby, N. C., from 1910 to 1913. In 1912 he was licensed in California. He later became associated with the Los Angeles County Medical Association and held the position of secretary-treasurer from 1919 to 1930, serving at the same time on the board of trustees. He became president of the Los Angeles County Medical Association in 1936 and served again on its board of trustees from 1939 until the time of his death.



HARLAN SHOEMAKER, M.D., 1875-1943

During the first world war Dr. Shoemaker was surgical examiner for District 17 and took part also in the work of rehabilitation of correctable defects. He was at the time of his death, and had been for years, senior surgeon at the Los Angeles County General Hospital, where in 1937 he was chief of the surgical staff. He had been clinical professor of surgery at the University of Southern California School of Medicine since 1920. He was a fellow of the American College of Surgeons and a member of the College of Physicians of Philadelphia, the Association of Military Surgeons of the United States and the Los Angeles Surgical Society.

Dr. Shoemaker will long be remembered for his leadership in medical affairs in the city of Los Angeles. He first conceived the idea of a permanent headquarters for the Los Angeles County Medical Association. He gave greatly of his time to the raising of money and to the negotiations necessary for the purchase of the property. As a result largely of his efforts the Los Angeles County Medical Association now owns a magnificent building which is its headquarters and also the ground on which the Wilshire Medical Building stands and from which the medical society derives a considerable income. He stimulated the development of the *Bulletin* of the Los Angeles County Medical Association and was largely responsible for the development of an excellent library. Many

of the important activities and properties of the Los Angeles County Medical Association stand as a memorial to the devoted efforts of Dr. Harlan Shoemaker.

Sanford Robinson Gifford ☉ Chicago, distinguished ophthalmologist, died in Passavant Memorial Hospital, February 25, aged 52, of virus pneumonia after a short illness.

Dr. Gifford was the son of Dr. Harold Gifford, widely known as an ophthalmologist. He was born in Omaha, Jan. 8, 1892. After graduating at Cornell University, Dr. Gifford received the degree in medicine at the University of Nebraska College of Medicine, Omaha, in 1918. He then served as bacteriologist in the U. S. Army during World War I with the rank of first lieutenant. He returned to Omaha in 1919, where he practiced with his father until 1929. He was instructor in ophthalmology at the University of Nebraska College of Medicine from 1919 to 1924, when he became assistant professor. In 1929 he joined the staff of Northwestern University Medical School, Chicago, as professor and chairman of the department of ophthalmology, a position he held at the time of his death. He was head of the department of ophthalmology, a member of the staff of Passavant and had been attending ophthalmologist at Cook County Hospital since 1932.



SANFORD ROBINSON GIFFORD, M.D., 1892-1944

Dr. Gifford was a member of numerous scientific groups, including the American Ophthalmological Society, American Academy of Ophthalmology and Otolaryngology, Association for Research in Ophthalmology, American College of Surgeons, the Institute of Medicine of Chicago and various honorary medical fraternities. He was certified by the American Board of Ophthalmology and the American Board of Plastic Surgery. In addition to many monographs on the bacteriology of the eyes, especially diseases due to fungi and higher bacteria, Dr. Gifford was the author of *A Handbook of Ophthalmic Therapeutics* and *A Textbook of Ophthalmology*. With Dr. J. M. Patton he reported the probable etiologic agent of the hitherto unknown disease, agricultural conjunctivitis. He had been associate editor of the *Archives of Ophthalmology* since 1928, a prolific contributor to the *American Journal of Ophthalmology* from the time he graduated in medicine until 1928 and corresponding editor of the *Klinische Monatsblätter für Augenheilkunde*.

The death of Dr. Gifford brought to an untimely end a brilliant career. He combined the research spirit with an exceedingly practical mind and was thus a leader in ophthalmic research and education as well as in the practice of ophthalmology. He was a cultured physician, with a profound interest in literature, music and the arts. His death leaves many vacancies in the civic, cultural and medical life of Chicago.

Clement Colfax Whitcomb * Colonel, U. S. Army, retired, St. Petersburg, Fla.; Medical School of Maine, Portland, 1891; served as a contract surgeon in the U. S. Army from July 28, 1900 to July 14, 1901; entered the medical corps of the U. S. Army as an assistant surgeon on July 15, 1901; promoted through the various grades to that of colonel on June 29, 1927; retired August 31, 1932 at his own request after thirty years' service; served with the American Expeditionary Forces in France during World War I; from 1919 to 1931 served as finance and supply officer in the surgeon general's office; fellow of the American College of Surgeons; member of the Association of Military Surgeons of the United States; received the award of the Legion of Honor of France and the Medal of Honor of Poland; died in the Veterans Administration Facility, Bay Pines, November 9, aged 75, of obstructive jaundice due to stricture of the common bile duct and chronic adhesive peritonitis.

Walter Lester Carr, Greenfield, Mass.; University of the City of New York Medical Department, New York, 1882; member of the Medical Society of the State of New York and the New York Academy of Medicine; member and past president of the American Pediatric Society; past president of the Medical Society of the County of New York and the American Association of Medical Milk Commissions; specialist certified by the American Board of Pediatrics, Inc.; clinical professor of pediatrics emeritus at the University and Bellevue Hospital Medical College, New York; served as consulting pediatrician at the Letchworth Village, Thiells, N. Y., New York Eye and Ear Infirmary, Woman's Hospital and the City Hospital, New York; formerly director of the department of pediatrics at the Midtown Hospital, New York; editor of "Practice of Pediatrics" published in 1906; collaborator, *Archives of Pediatrics*; died February 2, aged 84, of nephritis and myocarditis.

Samuel Goodwin Gant, Miami, Fla.; Missouri Medical College, St. Louis, 1887; member of the Medical Society of the State of New York and the American Proctologic Society; formerly professor and chief of the department for diseases of the colon, rectum and anus at the Broad Street Hospital Graduate School of Medicine, and professor of diseases of the colon, rectum and anus at the New York Post-Graduate Medical School and Hospital, New York; served as attending coloproctologist to the Broad Street and Harbor hospitals, consultant to the Hospital for Joint Diseases, New York, Huntington (N. Y.) Hospital, Jewish Memorial Hospital, New York, and Hackensack (N. J.) Hospital, and to Sing Sing Prison; author of "Constipation, Obstruction and Intestinal Stasis" and "Diseases of the Rectum, Anus and Colon"; died in the Victoria Hospital January 22, aged 69, of pneumonia.

William Pearce Coues * Brookline, Mass.; Harvard Medical School, Boston, 1894; served as instructor in clinical surgery at the Tufts College Medical School, Boston, and assistant in surgery at his alma mater; member of the New England Dermatological Society; fellow of the American College of Surgeons; a captain in the medical corps of the U. S. Army during World War I; for many years secretary of the Massachusetts Society of Examining Physicians; examiner for the Massachusetts Industrial Accident Board for twenty-five years; formerly examining physician for Boston schools; served on the staffs of the Massachusetts General Hospital and Boston Dispensary; consulting surgeon, the Massachusetts Eye and Ear Infirmary, Boston; trustee of the Brookline Historical Society; died January 13, aged 71, of angina pectoris and myxedema.

William Forester Davison, Kingston, Pa.; Jefferson Medical College of Philadelphia, 1896; member of the Medical Society of the State of Pennsylvania; during World War I a member of the local examining board for division number 4, Luzerne County, and later commissioned a first lieutenant in the medical corps of the U. S. Army, transferred to Camp Lee as head of the intelligence department at the base hospital; chairman of the Pennsylvania Association of Dairy and Milk Inspectors; served as supervising medical inspector of the schools in Luzerne and Lackawanna counties; medical director of Luzerne County; on the staff of the Nesbitt Memorial Hospital; died January 9, aged 76, of coronary embolism.

Henry Herrington Asher, Manistique, Mich.; University of Kansas School of Medicine, Kansas City, Kan., 1934; member of the Kansas Medical Society; health officer of Alger and Schoolcraft counties; formerly director of the division of local health of the Kansas State Board of Health; for two years health officer of Sedgwick County, Kan.; at one time health officer of district number 6 in Missouri, consisting of fourteen counties; captain, medical reserve corps, U. S. Army, not on active duty; died in the Munising Hospital, Munising, January 13, aged 34, of pneumonia.

Harry Holyroyd Ainsworth, Birchwood, Wis.; College of Physicians and Surgeons of Chicago, 1895; member of the State Medical Society of Wisconsin; past president of the Barron-Washburn-Sawyer-Burnett Counties Medical Society; formerly served as a member and president of the state board of health; served during World War I; on the staff of the Northern Wisconsin Colony and Training School, Chippewa Falls; died January 8, aged 71, of cardiac decompensation.

Mira May Allen, Rochester, N. Y.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1899; for many years associated with the Rochester Health Bureau; served as assistant director of the child hygiene division, Indiana State Board of Health, Indianapolis; formerly in charge of a colony of 1,000 French children at Dinard, France; died January 10, aged 73, of pneumococcal meningitis and osteoarthritis.

Frank R. Atkins, Caruthersville, Mo.; Missouri Medical College, St. Louis, 1883; at one time physician and surgeon for the Hollady Klotz Land and Lumber Company, Greenville; died January 5, aged 84, of senility.

Joseph B. Bailey * Clyde, Texas; Memphis (Tenn.) Hospital Medical College, 1903; on the staff of the Hendrick Memorial Hospital, Abilene, where he died January 3, aged 65, of coronary thrombosis.

Ephraim S. Barger, Omaha, Ill.; Marion-Sims College of Medicine, St. Louis, 1899; also a druggist; died in the Ferrell Hospital, Eldorado, January 1, aged 81, of nephritis.

Frank Talmage Barker * Tampa, Fla.; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1919; U. S. Naval Medical School, 1922; formerly secretary of the Hillsborough County Medical Society; at one time served in the medical corps of the U. S. Navy; on the staffs of the Tampa Municipal and St. Joseph's hospitals; died suddenly January 5, aged 47, of coronary thrombosis.

Alexander Chambers Blair, Pittsburgh; Hahnemann Medical College and Hospital of Philadelphia, 1898; member of the Medical Society of the State of Pennsylvania; on the staffs of the Homeopathic Medical and Surgical Hospital, now the Shadyside Hospital, and the Allegheny General Hospital; died January 4, aged 74, of arteriosclerosis.

Fred Eugene Butler Jr. * Salem, Mo.; University of Kansas School of Medicine, Kansas City, 1930; secretary-treasurer of the Dent County Medical Society; a first lieutenant in the medical reserve corps of the U. S. Army not on active duty; served on the staffs of the Evangelical Deaconess Home and Hospital, St. Louis, Nelle McFarland Memorial Hospital, Rolla, and the Trinity Lutheran Hospital, Kansas City; died in the Missouri Baptist Hospital, St. Louis, January 3, aged 40, of myocarditis.

Matthew Thompson Dingess * Atchison, Kan.; Kentucky School of Medicine, Louisville, 1890; surgeon for the Burlington and Santa Fe Railways; on the staff of the Atchison Hospital, where he died January 8, aged 76, of pneumonia.

Edwin J. Dorminy, Fitzgerald, Ga.; University of Maryland School of Medicine, Baltimore, 1890; member of the Medical Association of Georgia; formerly a member of the state house of representatives and senator; served as a councilman, county physician, and director in the local banks; president of the Fitzgerald Hospital; died January 13, aged 76, following a laminectomy.

William Milas Dunn * Atlanta, Ga.; Johns Hopkins University School of Medicine, Baltimore, 1911; lieutenant in the U. S. Navy during World War I; on the staffs of the Crawford W. Long Memorial, Piedmont, Emory University and Grady hospitals and St. Joseph Infirmary; died in the Veterans Administration Facility, January 4, aged 62, of cerebral hemorrhage.

Richard Gardner Eaton, Sedro Woolley, Wash.; Harvard Medical School, Boston, 1896; member of the American Psychiatric Association; served in the medical corps of the U. S. Army during World War I; at one time superintendent of the Idaho Insane Asylum, Blackfoot; for many years served on the staffs of various Veteran Administration facilities; on the staff of the Northern State Hospital, where he died January 7, aged 74, of influenza and pneumonia.

Simon Ehrlich, Boston; Middlesex College of Medicine and Surgery, Cambridge, Mass., 1926; on the staffs of the Harley Private Hospital and the Forest Hills General Hospital, Forest Hills; died in the Allerton Hospital, Brookline, Mass., January 4, aged 46, of coronary thrombosis.

Leslie Carlisle Fisher, Green Cove Springs, Fla.; Atlanta (Ga.) School of Medicine, 1909; served on the city commission and at one time as mayor of Green Cove Springs; member of the Rotary Club; died January 8, aged 59, of heart disease.

Luke Joseph Fleming, Tarrytown, N. Y.; Bellevue Hospital Medical College, New York, 1893; attending physician at the Tarrytown Hospital, where he died January 23, aged 75, of uremia, nephrosclerosis and hypertensive cardiovascular disease.

Walter S. Given, Indianapolis; Central College of Physicians and Surgeons, Indianapolis, 1901; at one time assistant professor of gastrointestinal surgery at the Indiana University School of Medicine; served during World War I; died in the Veterans Administration Facility, Hines, Ill., January 22, aged 65, of carcinoma of the esophagus.

D. H. Godsey, Hartford, Ky.; Hospital College of Medicine, Louisville, 1901; a member of the local draft board number 130; died January 6, aged 73, of angina pectoris.

Gould Shelton Higgins, South Coventry, Conn.; Yale University School of Medicine, New Haven, 1901; died in the Windham Community Memorial Hospital, Willimantic, January 5, aged 68, of an accidental overdose of pentobarbital sodium.

James Hinchliff, Minburn, Iowa; Keokuk Medical College, College of Physicians and Surgeons, 1905; member of the board of education and town council; died January 10, aged 64, of hypostatic pneumonia and cerebral hemorrhage.

George McClintoc Hutchison ♂ Ridgway, Pa.; Medico-Chirurgical College of Philadelphia, 1907; formerly a dentist; fellow of the American College of Physicians; on the staff of the Andrew Kaul Memorial Hospital, St. Marys; died in the Cleveland Clinic Foundation Hospital January 6, aged 68, of peritonitis.

Jesus Daniel Ibarra, San Antonio, Texas; Universidad Nacional Facultad de Medicina, Mexico, D. F., 1902; died in the Santa Rosa Hospital January 7, aged 63, of lobar pneumonia.

Jeremiah Swain Irwin ♂ Erie, Pa.; Medico-Chirurgical College of Philadelphia, 1906; served on the staffs of St. Vincent's and Hamot hospitals; found dead in his car January 18, aged 62, of coronary thrombosis.

John Francis Xavier Jones, Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1907; Jefferson Medical College of Philadelphia, 1910; fellow of the American College of Surgeons; served in the U. S. Navy during World War I; on the staffs of the Jefferson, Misericordia, St. Agnes and St. Joseph's hospitals; died in the Veterans Administration Facility, Coatesville, January 7, aged 63, of pneumonia.

Julius Calvin Oram ♂ South Portland, Maine; Bowdoin Medical School, Portland, 1915; president of the Cumberland County Medical Society; served in the medical corps of the U. S. Army during World War I; for two terms served on the school committee; at one time city physician; member of the staffs of the Maine General Hospital, Maine Eye and Ear Infirmary, and Portland City Dispensary; a director of the South Portland Building and Loan Association; died in the Deaconess Hospital, Boston, November 19, aged 58, of status asthmaticus.

Finley Van Orsdall, Baton Rouge, La.; Medical College of Ohio, Cincinnati, 1902; served as an acting assistant surgeon in the U. S. Public Health Service; for many years chief of bureau of communicable diseases, Ohio State Department of Health at Columbus; at one time on the staff of the Murphy Sanatorium, Albuquerque, N. M.; died January 11, aged 69, of cerebral hemorrhage.

Robert Eugene Pugh, Lawton, Okla.; University of Oklahoma School of Medicine, Oklahoma City, 1936; member of the Oklahoma State Medical Association; on the staff of the Angus Hospital; died at Haskell in November, aged 32, of nephritis and hypertension.

Thomas Minor Redd, Atlantic City, N. J.; Jefferson Medical College of Philadelphia, 1887; died in the Atlantic City Hospital December 31, aged 79, of bronchopneumonia, nephritis, myocarditis and arteriosclerosis.

Henry Jesse Spalding ♂ Union City, N. J.; Cornell University Medical College, New York, 1900; physician for the Selective Service during World War I and World War II; consulting physician at the North Hudson Hospital, Weehawken, and the Christ Hospital, Jersey City; died December 27, aged 67, of coronary thrombosis and arteriosclerotic heart disease.

Frederick William Steiner ♂ Havre de Grace, Md.; College of Physicians and Surgeons, Baltimore, 1907; past president of the Harford County Medical Society; chief of staff of the Harford Memorial Hospital; second vice president, Havre de Grace Banking and Trust Company and president of the

City Building and Loan Company; died in the Union Memorial Hospital, Baltimore, November 25, aged 65, of injuries received in an automobile accident.

Samuel Topkins, Brooklyn; University of Vermont College of Medicine, Burlington, 1915; on the staff of the Israel Zion Hospital, where he died December 28, aged 57, of coronary sclerosis.

Samuel William Treptow, San Diego, Calif.; Memphis (Tenn.) Hospital Medical College, 1891; died December 24, aged 76, of cerebral hemorrhage.

Ethron L. Trevitt, West Point, Iowa; Eclectic Medical Institute, Cincinnati, 1887; died in Fort Madison December 7, aged 81, of pernicious anemia.

William Frederick Turner, Cranford, N. J.; University of Pennsylvania Department of Medicine, Philadelphia, 1879; died December 30, aged 87, of influenza and arteriosclerosis.

Sylvester Ulrich, Elizabethtown, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1890; member of the Medical Society of the State of Pennsylvania; on the staff of St. Joseph's Hospital, Lancaster, where he died January 4, aged 81, of cerebral hemorrhage.

William Henry Vail, Newark, N. J.; College of Physicians and Surgeons of Columbia College, New York, 1869; oldest alumnus of Princeton University, the Columbia University College of Physicians and Surgeons, New York, and the Blair Academy, Blairstown; a trustee of the academy for many years; died December 31, aged 98, of chronic myocarditis.

Archibald Walter Ward, Minneapolis; University of Nebraska College of Medicine, Omaha, 1911; member of the Minnesota State Medical Association; fellow of the American College of Surgeons; on the staffs of the Asbury Hospital and the Swedish Hospital, where he died recently, aged 61, of cerebral hemorrhage, hypertension and orbital abscess.

John Piper Williams ♂ Lincoln, Neb.; Northwestern University Medical School, Chicago, 1896; served during World War I; life member of the chamber of commerce; on the staff of St. Elizabeth Hospital; died December 13, aged 70, of carcinoma of the liver.

Benjamin Ezra Wood ♂ Canton, Mass.; Harvard Medical School, Boston, 1906; resident member of staff, Massachusetts Hospital School; died December 25, aged 64, of cerebral hemorrhage.

Joseph Bidmead Wright, Pasadena, Calif.; University of the City of New York Medical Department, New York, 1879; formerly on the staffs of the New York Polyclinic Medical School, New York, and North Eastern Dispensary, New York; died January 8, aged 85, of coronary arteriosclerosis.

Kate E. Geiger Yont, Denver; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1896; member of the Colorado State Medical Society; died in the Mercy Hospital December 7, aged 71, of carcinoma of the rectum and sigmoid.

Edgar Nelson Young, San Diego, Calif.; College of Physicians and Surgeons, Los Angeles, 1912; member of the California Medical Association; died in the Mercy Hospital December 23, aged 58, of cerebral embolus and mitral stenosis.

DIED WHILE IN MILITARY SERVICE

Porter Madeira Hoidale ♂ Surgeon, Lieutenant Commander, U. S. Navy, Tracy, Minn.; University of Minnesota Medical School, Minneapolis, 1940; received his B.A. from Carleton College, Northfield, Minn., in 1931; he then entered the aviation branch in the Marine Corps, taking his training at Great Lakes, Pensacola, Fla., and Coronado Air Base, San Diego; commissioned lieutenant Aug. 4, 1939; began extended active duty in the U. S. Marine Corps as a captain (naval aviator) Nov. 25, 1940; while at San Diego he requested transfer from the Marines to the Navy, which was granted by special act of congress to secure his full rank status; entered the medical corps of the U. S. Navy as a passed assistant surgeon, lieutenant on March 20, 1942; ordered to active duty in the New Hebrides area Aug. 8, 1942 as flight surgeon on the staff of Admiral Fitch, where he served for six months; later transferred to the aircraft carrier *Enterprise*; chief medical officer of the naval air base at Klamath Falls, Ore., died in a hospital at Klamath Falls, January 23, aged 34, of a head injury received January 12.

Bureau of Investigation

STIPULATIONS

Agreements Between Federal Trade Commission and Promoters of Various Products

Following are abstracts of stipulations in which promoters of "patent medicines," medical devices and cosmetics have agreed, following action by the Federal Trade Commission, to discontinue certain misrepresentations in their advertising. These stipulations differ from the "Cease and Desist Orders" of the Commission in that such orders definitely direct the discontinuance of misrepresentations. The abstracts that follow are presented primarily to illustrate the effects of the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act on the promotion of such products:

Blackstone Hair Coloring—The Federal Trade Commission reported this to be a coal tar hair dye, and objected to some of the advertising claims for it, such as that it restores hair to its natural color and is harmless to use, whereas it contains ingredients which may cause skin irritation to certain individuals. In April 1943, the promoter, W. T. Boomer, trading as Boomer's Mail Order Service, Portsmouth, Va., entered into a stipulation with the Federal Trade Commission, agreeing to discontinue any advertisement which failed to state that this product contains ingredients which may cause skin irritation to certain users and hence a preliminary test according to accompanying directions should first be made, besides the accompanying caution that the product should not be used for dyeing the eyelashes or eyebrows, lest it cause blindness. The stipulation provided, however, that if the label should bear these warnings conspicuously, it would be sufficient for the advertisement to contain only the statement, "Caution Use only as directed on the label."

Chartered University of America—This was a Huron, S. D., corporation, with W. A. Johns, Julia W. Johns and Isaiah O. Hagen as directors. They were charged by the Federal Trade Commission with false advertising and misrepresentation in connection with the sale to purchasers in India of so-called diplomas purporting to evidence the conferring of scholastic degrees. In March 1943 they stipulated with the Commission that they would desist from false advertising and from using the words "university," "medical council" or "board of examinations" in their corporate or other trade name, or any other word of like meaning in any manner which might give the impression that they conduct such institutions. Further, they agreed to cease representing, through the issuance of so-called diplomas or degrees which purport to have been conferred by a fully qualified educational institution, that their business is that of a university or an institution of learning. In addition, they were no longer to represent that they issue diplomas or degrees that are recognized or accepted by any reputable college or university, or that these incorporators themselves have had such degrees as M. A., LL. D. or Ph. D., which they have used after their names, conferred on them by an accredited college or institution.

Formula 234, Skin Peel—This was the subject of an agreement between Winslow Chase, trading as the Thaxby Company, Washington, D. C., and the Federal Trade Commission. In this Chase stipulated that he would cease representing that his product is harmless and discontinue any advertising which failed to reveal that the preparation should not be administered except under the direct and continual supervision of a physician. Further, Chase agreed to drop from his advertising certain claims as to the effectiveness or quality of products made from formulas that he sold for hair tonics and other cosmetics.

Hollywood Liquefier—This was put out by one Seremus Wills, trading as Hollywood Liquefier Sales, Los Angeles, and was intended for pulverizing and reducing fruits and vegetables to a puree or a semi-liquid condition. In February 1943 Wills entered into a stipulation with the Federal Trade Commission, agreeing to discontinue certain advertising representations, such as that, among other things, fruits or vegetables must be reduced to a semi-liquid state in order to be digested, that his device renders the nutritive substances in fruits, vegetables, meats or nuts more easily digestible than in their customary forms, that the ordinary diet is deficient in vital organic materials found in fresh fruits or vegetables, or that the cells of fruits or vegetables must be broken down by a mechanical device such as the one he sells.

Lak and Lak Plus—These are sold by a Los Angeles concern calling itself Makers of Kal, Inc., which in March 1943 stipulated with the Federal Trade Commission that it would cease misrepresenting the therapeutic properties of these products, as follows: That they improve bowel health, exercise intestinal muscles or constitute a remedy or cure for constipation or a treatment for sluggish digestion or for any condition of nervousness, or eliminate poisonous waste from the body, build resistance to fatigue or improve the general state of health.

Milkmaid Cosmetics—These are put out by Milkmaid, Inc., New York, and Lorr Laboratories, Paterson, N. J. In April 1943 these concerns and the H. M. Kiesewetter Advertising Agency, Inc., New York, stipulated with the Commission that they would cease representing that the preparations will nourish the skin or that the cosmetic designated "Milkmaid Emulsion" contains milk or cream. Further, in advertising this

particular product, they agreed to discontinue using the word "Milkmaid" unless in direct conjunction therewith it is stated that the preparation does not contain milk.

Min-O-Ral—That this mineralized water, when taken as directed, would be of any therapeutic value other than in the treatment of iron deficiencies or, when administered externally, would offer any benefit other than that of an inhibitory antiseptic or an astringent or styptic were advertising misrepresentations which Steve Ladas and Olga Spanapoulos, trading as the Min O-Ral Products Company, Detroit, agreed to discontinue in a stipulation which they entered into with the Federal Trade Commission in March 1943. Further, they agreed to cease representing that the product provides an adequate treatment or permanent or temporary relief for headaches, kidney or bladder disorders, arthritis, gout, or stiffening of the joints, or that it will overcome fatigue, provide energy, correct weakness or underweight, or promote resistance to infections or run down conditions resulting from impoverished blood, improper elimination or any other cause.

Nu-Yorkers' Infra-Red Scalp Cap and Nu-Yorkers' Infra-Red Beauty Mask—A. O. Dyke, Miami, Fla., trading as The Nu Yorker, stipulated with the Federal Trade Commission in March 1943 that in the sale of these devices he would cease making the following misrepresentations in his advertising: That either the Cap or the Mask constitutes an adequate treatment or dependable relief for sinus congestion or head colds, has any alkaline or antiseptic effect, is of value in treating nervous diseases, destroys germ life or has any effect on the action of the skin other than as a temporary stimulant of the flow of blood or perspiration. He further agreed to cease using the word "Infra Red" or other words of like meaning which might give the impression that any material heating effect resulting from use of these devices is produced by infrared radiation, and such phrases as "low, medium and high heat," which might imply that the devices are capable of maintaining three different, distinct degrees of heat.

Regina—This coal tar hair dye is put out by Humbert Cagnazzi, Getano Visceglie and Nelson Torelli, trading as the Nem Company, New York. In March 1943 these persons entered into a stipulation with the Federal Trade Commission to cease making the advertising misrepresentation that their dye contains an ingredient which will provide the user with special or unique benefits, and to discontinue any promotion which fails to warn the user of Regina that the product contains ingredients which may cause skin irritation to certain individuals, requires a preliminary test, and should not be used for dyeing the eyelashes or eyebrows, lest it cause blindness. The stipulation provided, however, that the advertisements need contain only the statement, "Caution Use only as directed on label" if the said labeling should bear the proper warning and adequate directions for the preliminary test.

Tissue Food Tablets A and B, Cerate, and Head-Hold Spine Stretch Harness—These are put out by Florence English Henry, trading as Dr. V. P. English, San Diego, Calif. In March 1943 she stipulated with the Federal Trade Commission that she would discontinue the following misrepresentations, among others, in connection with her advertising: That the medicines and the body harness, used alone or in combination, as directed or otherwise, constitute a remedy, cure, or an aid in the treatment of displaced vertebrae or spinal irritations, nerve pressure, spinal pains, hysteria, insanity and certain ailments of the stomach, liver and kidneys, as well as rheumatism, paralysis, sciatica and eye diseases, that her Cerate is a superior remedy or cure for burns, cuts or chapped skin or has any value other than as a mild counterirritant, that the body harness pulls vertebrae in the spine away from each other, stops the "squeeze" on spinal nerves between the bones, or relieves pain and distress caused by pressure on the nerves, and that her "Book No. 4" shows how to relieve spinal irritation or that by its method relief can be given by another person. Florence Henry further agreed to discontinue using the words "Tissue Food" in the brand name of her other preparations, or otherwise representing that they constitute a food for tissues.

Vitalix Reducing Plan—This "treatment" was promoted by Vitalix, Inc., Canton, S. D., and consisted of "Mild Laxative Tablets" and "Active Laxative Tablets," supplemented by a "Reducing Week Diet" and a "Normal Week Diet," with a list of exercises added. In March 1943 the concern entered into a stipulation with the Federal Trade Commission, agreeing not to publish any advertisement which would fail to reveal that its "Reducing Week Diet" may be harmless unless supervised by a physician, or any which did not reveal that the two types of laxative tablets should not be taken in the presence of symptoms of appendicitis, and that the frequent or continued use of them may result in dependence on laxatives. The concern, however, was permitted to limit its warning to the statement, "Caution Use only as directed" if and when the label contained a warning to the same effect. The company further agreed to cease representing, through the use of the word "Normal" in referring to its "Normal Week Diet," that such a diet allows for normal food consumption.

Vita-Pneumatic Action Truss—This is sold by one Julius Portnow, trading as the Pneumatic Institute Company, New York. In March 1943 he stipulated with the Federal Trade Commission that he would cease representing that his device is a new discovery or that the use of it will prevent difficulties associated with hernia, or do more than give relief from certain types of this disorder. By the terms of the stipulation Portnow was no longer to represent that he had been a rupture specialist for 42 years or any designated period of time in excess of what is actually the fact, and that the device which he sells is not a truss or that by its use a person would receive medical or non-mechanical treatment that would enable him to dispense with wearing a truss. Portnow also was to cease employing the word "institute" in his trade name or in any manner giving the impression that his business is that of an association engaged in promoting medical science or the art of healing.

Correspondence

HYPERTENSION IN MILITARY SERVICE

To the Editor:—Your editorial in *THE JOURNAL*, Nov. 13, 1943, page 703, concerning hypertension in military service again raises a question which must be continually plaguing the conscientious medical examiner for the military services and which is beginning to become of considerable practical importance to the civilian physician as more and more young men are rejected for induction or are discharged from the armed services because of borderline or actual hypertensive disease. I am seeing an average of two or three young men each week who have become anxious over the present significance and possible future serious consequences of the finding of an elevated blood pressure by selective service or army or navy medical examiners. Most of these men feel that they would not have been rejected or discharged from the armed services if they had not had a serious degree of hypertensive disease. Actually, the majority of such young men whom I have seen would be classed more reasonably as "vascular hyperreactors," and the question of when or whether they will have serious hypertensive disease is left unanswered.

I agree that the solution of the problem of what to do with persons with a hyperreactive blood pressure cannot be settled practically by rejecting all persons who have an elevated blood pressure on any one reading. Such a procedure would certainly exclude from military service a large group of young men who probably would make efficient or even superior soldiers if some care was taken to see that they were placed in the right kind of job. It is probable that a rather large number of men who are being rejected for this reason might not have significant or disabling hypertensive disease for many years. There seems to be no standard procedure for acceptance or rejection of such men, and indeed it is impossible that such a standard could be set up at the present time with any reasonable degree of reliability. The plain truth is that one does not have sufficient information to answer the question of what to do with the person with transient elevations of blood pressure. Such information was not available at the time of the Civil War or at the time of World War I or at the beginning of World War II, and if one is to be realistic it must be realized that unless this fact is recognized and something is done about it such information will not be available at the time of the next war.

A conclusive answer to the question of what is the significance of varying degrees of hyperreactivity of the blood pressure at different ages in wartime cannot be obtained except by a long distance follow-up study of an adequately large and well controlled group of young men and women who have had especially controlled and recorded preliminary studies of their blood pressure and who have been followed through a war in varying kinds of duties and for from ten to twenty years afterward. The information obtained from studies of special groups such as insurance applicants or army officers or hospital patients or comparative studies of groups of different ages in regard to blood pressure readings and blood pressure reactions to various pressor tests can never do more than indicate the possibilities and emphasize the importance of following a large group of especially controlled individuals through a lifetime in order to obtain conclusive information.

One does not at the present time know with any reasonable certainty the incidence of hypertensive disease at different ages in the general population, the incidence of vascular hyperreactivity or whether it increases with age, or the significance of vascular hyperreactivity as measured by the reaction of the blood pressure to various pressor stimuli. Until one knows the answer to these questions it is not possible to give a conclusive answer to what should be done with the person with transient elevations of blood pressure. One might as well admit that the answer to these questions probably will not be available during this war

unless it lasts for ten to twenty years, as some people are predicting, but one should not let the opportunity of eventually obtaining the answer to these questions slip by. One should be gathering and cataloguing information during this war and should have a setup for following it up for many years after the war. It is hoped that such an opportunity will not soon be presented again. It was proposed as long as three years ago that a large enough group of men in the armed services be especially studied with regard to their blood pressure regulating mechanism and that they be followed through their active service and after the war for ten to twenty years by a permanent committee such as the Soldier's Heart Committee of the last war. This is the only way that I can see to obtain an answer to the most pertinent question of the significance of vascular hyperreactivity. My purpose in this letter is to emphasize again the desirability of such a study. I have learned through a personal communication from Dr. Paul D. White, chairman of the Subcommittee on Cardiovascular Diseases of the National Research Council, that certain studies of blood pressure have been under way for the last year or two under the National Research Council and that others are contemplated but, as far as I know, no such study as proposed in this communication has yet been started and the opportunity for making such a study is rapidly being lost unless the war lasts much longer than most people predict.

EDGAR A. HINES JR., M.D., Rochester, Minn.

"YAWS, LEISHMANIASIS AND PINTA"

To the Editor:—Dr. Howard Fox's article on "Yaws, Cutaneous Leishmaniasis and Pinta" (*THE JOURNAL*, Oct. 23, 1943) contained a few statements which I do not think should go unchallenged, especially as it was stated in a footnote that he will be writing on this subject in a book to be published shortly.

1. The macular eruption mentioned as nearly always absent in yaws is the earliest of the second stage lesions to appear in a typical case of yaws. It appears on the average three to four weeks after the primary lesion and not infrequently.

2. The statement ". . . in the early stages the disease may be permanently cured by three successive injections of neoarsphenamine, though much more treatment is required in the late stage" is misleading. Cure is not effected in a percentage of early cases treated with four to six injections of either neoarsphenamine or bismuth salicylate. I have had several cases with first and early second stage lesions which even gave negative serologic reactions following treatment and yet relapsing lesions developed many months after. Two cases with dark field positive primary lesions of one month's duration, and with no second stage lesions, were treated with six injections of bismuth salicylate. The lesions healed in the usual average length of time, but at six months and at twenty months in the 1 case, and at eighteen months in the other, second stage lesions developed. In addition, it seems inaccurate to use the word "cured" after such limited treatment. In 411 cases of yaws with Wassermann reaction positive treated with six injections of neoarsphenamine the lesions cleared in the usual time but the Wassermann reaction was still positive at the end of six months in 74.56 per cent of these cases; it was positive at the end of one year in 55.03 per cent, at the end of eighteen months in 45.50 per cent and at the end of two years in 31.63 per cent of the cases.

3. With the introduction of specific treatment in several active lesions of gangosa there was apparently no further loss of cartilaginous tissue; therefore to say that this lesion is practically incurable seems unduly pessimistic.

4. The statement "there is eventually complete cross immunity between syphilis and yaws, though there are differences in the immune state in the two diseases" is debatable. It is probable that infection with yaws provides a defense mechanism that

gives some measure of protection against syphilis after some time has elapsed. This protection is even then not necessarily complete. H. M. Hanchell (*Brit. J. Ven. Dis.* 4:64, 1928) mentions a case in which syphilis was contracted nine years after an attack of yaws and while the Wassermann reaction was still strongly positive as a result of a previous infection with yaws. One of my patients was a woman aged 29 who had been brought up in a yaws endemic area. She was infected with yaws as a child of 9 (the scar of the primary lesion was still on her leg). She had received no treatment. Some years after puberty (eight or nine years later) she had intercourse with several men who had lived in the seaport town of Kingston, Jamaica. When she was 19 years old she gave birth to a daughter. This child was seen at 10 years of age and examined. The facies was typically syphilitic, with frontal bossing, Hutchinson's teeth (with characteristic convergence of the lateral surfaces of the central upper and lower incisors) and saddle nose deformity. The child had also corneal opacity and was blind in the right eye. The mother herself had suffered from a macular rash scattered over her body shortly after beginning her promiscuous life. This case was not reported in my book on yaws, much of the material for which was gained when I was attached to the Yaws Commission, under the Rockefeller Foundation and the government of Jamaica.

H. D. CHAMBERS, M.D.,
Kingston, Jamaica, B. W. I.

CREEPING ERUPTION

To the Editor:—In the issue of THE JOURNAL of Dec. 11, 1943, in a communication to the editor, Lieut. Harvey Blank, M. C., of this hospital reported a case of creeping eruption treated with sodium antimony bismatechol (fuadin) intramuscularly without any apparent benefit. Herewith is a report of a case apparently cured by this method of treatment.

On Dec. 16, 1943 a soldier was admitted to our service with an eruption of the abdomen, chest, right thigh and right upper extremity of two months' duration. A diagnosis of creeping eruption was made. At admission 32 distinct active tracks were seen, and under observation all tracks were noted to be active. Some of the larvae moved as much as $\frac{1}{2}$ to $\frac{3}{4}$ inch in forty-eight hours. The treatment was as follows:

On December 20, fuadin 1.5 cc. was administered intramuscularly as a test to determine any idiosyncrasy to the drug. Doses of 5 cc. were given on December 21, 22, 23, 24, 25 and 26.

A rest period of one week was allowed the patient, and the injections were continued. Since the patient presented no untoward symptoms and daily urinalyses were negative, it was decided to increase the daily dose to 7 cc., which was given on Jan. 2, 3, 4, 5 and 6, 1944. On the 4th the pruritus of the lesions had greatly diminished. On the 5th there was very little pruritus. The tracks on the abdomen were beginning to fade. On the 6th only seven tracks were active. There remained very little pruritus. On the 8th there were only two active tracks, with practically no pruritus. On the 12th there was only one active lesion, on the dorsum of the right hand. On the 14th there were no active lesions, but the lesion on the hand was slightly pruritic. On the 16th the lesion on the hand was not active, but a small elevated pruritic nodule on the dorsum of the right hand was remaining. On the 22d there were no active lesions, but because the patient was being discharged the pruritic nodule at the end of the track on the dorsum of the hand was sprayed with ethyl chloride. On the 24th the pruritic nodule of the hand was still present. It was sprayed with ethyl chloride. On January 28 the patient was discharged with no active or pruritic lesions.

This, then, is the second reported case of creeping eruption which was benefited by intramuscular injections of sodium antimony bismatechol (fuadin).

SIMON S. RUBIN, Captain, M. C., A. U. S.
Chief of Dermatology and Allergy Section, Headquarters
Station Hospital, Camp Livingston, Louisiana.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, Feb 26, page 596.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, Oct. 24-26 Sec., Dr. B. F. Austin, 519 Dexter Ave., Montgomery
ALASKA: Juneau, March 7 Sec., Dr. W. M. Whitehead, Box 561, Juneau.
ARIZONA: Phoenix, April 4-5 Sec., Dr. J. H. Patterson, 826 Security Bldg., Phoenix
ARKANSAS: March Sec., Dr. D. L. Owens, Harrison Eclectic Little Rock, June 8 Sec., Dr. C. H. Young, 1415 Main St., Little Rock.
CALIFORNIA: San Francisco, June 27-29 Sec., Dr. Frederick N. Setena, 1020 N St., Sacramento
COLORADO: Denver, April 4-7 Sec., Dr. J. B. Davis, 831 Republic Bldg., Denver.
CONNECTICUT: Medical Written, Hartford, March 14-15 Endorsement, New Haven, March 28. Sec. to the Board, Dr. Creighton Barker, 258 Church St., New Haven Homoeopathic, Derby, March 13-14. Sec., Dr. J. H. Evans, 1488 Chapel St., New Haven.
DISTRICT OF COLUMBIA: Reciprocity, Washington, March, Sec., Commission on Licensure, Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington
FLORIDA: Jacksonville, June 26-27 Sec., Dr. W. M. Rowlett, Box 786, Tampa
ILLINOIS: Chicago, April 4-6. Supt. of Registration, Department of Registration and Education, Mr. Philip Harman, Springfield
INDIANA: Indianapolis, May 2-4 Sec., Board of Medical Registration and Examination, Dr. W. C. Moore, 301 State House, Indianapolis.
MAINE: Portland, March 14-15 Sec., Board of Registration of Medicine, Dr. A. P. Leighton, 192 State St., Portland.
MASSACHUSETTS: Boston, March 14-17 Sec., Board of Registration in Medicine, Dr. H. O. Gallupe, 413 F State House, Boston.
MINNESOTA: Minneapolis, April 18-20 Sec., Dr. J. F. DuBois, 230 Lower Medical Arts Bldg., St. Paul.
MISSOURI: St. Louis, August Sec., State Board of Health, Dr. James Stewart, State Capitol Bldg., Jefferson City
MONTANA: Helena, April 3-5 Sec., Dr. O. G. Klein, First National Bank Bldg., Helena.
NEW HAMPSHIRE: Concord, March 9-10 Sec., Board of Registration in Medicine, Dr. D. G. Smith, State House, Concord
NEW MEXICO: Santa Fe, April 10-11 Sec., Dr. LeGrand Ward, 141 Palace Ave., Santa Fe
NEW YORK: Albany, Buffalo, New York City and Syracuse, June 26-29 Sec., Dr. R. R. Hannon, Education Bldg., Albany
NORTH DAKOTA: Grand Forks, July 5-8 Sec., Dr. G. M. Williamson, 4½ S Third St., Grand Forks
OHIO: Endorsement, Columbus, April 4 Sec., Dr. H. M. Platter, 21 W Broad St., Columbus
OREGON: Endorsement, Portland, April 22 Exec Sec., Miss L. M. Conlee, 608 Failing Bldg., Portland
RHODE ISLAND: Providence, April 6-7 Chief, Division of Examiners, Mr. Thomas B. Casey, 366 State Office Bldg., Providence
SOUTH CAROLINA: Columbia, June 26-28 Sec., Dr. N. B. Heyward, 1329 Blandena St., Columbia
TEXAS: Houston, March 22-24. Final date for filing application is March 10 Sec., Dr. T. J. Crowe, 918 20 Texas Bank Bldg., Dallas
WEST VIRGINIA: Charleston, May 1-3 Commissioner, Public Health Council, Dr. John E. Offner, State Capitol, Charleston.
WISCONSIN: Milwaukee, June 27-29 Sec., Dr. C. A. Dawson, Tremont Bldg., River Falls

* Basic Science Certificate required

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARKANSAS: Little Rock, March 6 Sec., Mr. L. E. Gebauer, 701 Main St., Little Rock
COLORADO: Denver, March 8-9 Sec., Dr. E. B. Starks, 1459 Ogden St., Denver.
DISTRICT OF COLUMBIA: Washington, April 17-18 Sec., Commission on Licensure, Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington
FLORIDA: Gainesville, June 8 Sec., Dr. J. F. Conn, John B. Stetson University, DeLand
IOWA: Des Moines, April 11 Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines
MICHIGAN: Ann Arbor and Detroit, May 12-13 Sec., Miss Eloise LeBeau, 101 N. Walnut St., Lansing
MINNESOTA: Minneapolis, April 4-5 Sec., Dr. J. C. McKinley, 126 Millard Hall, University of Minnesota, Minneapolis
NEBRASKA: Omaha, May 2-3 Dir., Bureau of Examining Boards, Mr. Oscar F. Humble, 1009 State Capitol Bldg., Lincoln
OREGON: Portland, March 4 Sec., Board of Higher Education, Mr. C. D. Byrne, University of Oregon, Eugene
SOUTH DAKOTA: Vermillion, June 4-5 Sec., Dr. G. M. Evans, Yankton.
WISCONSIN: Madison, April 1 Sec., Prof. R. N. Bruer, 152 W. Wisconsin Ave., Milwaukee

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Optometry Practice Acts: Illegality of Corporate Practice.—Beiling, who was licensed to practice optometry in Kentucky, was employed on a salary and bonus basis by the Kay Jewelry Company, a corporation. He had exclusive control of the optical department in the corporation's store, and his professional judgments and acts were not interfered with by the corporation. He made examinations and tests of customers of the store and prescribed such lenses as he deemed necessary. The lenses so prescribed were manufactured by another company and forwarded to the corporate employer. Beiling would then fit the glasses on the so-called patient. All fees and charges were paid directly to the corporation, which kept the records and accounts. The corporation advertised this department as "Our Modern Optical Department," sometimes naming Beiling as its employed optometrist and sometimes not mentioning him at all.

The Kentucky optometry practice act specifically authorizes the revocation of the license of any licensee who abets in the practice of optometry any person not holding a license to practice optometry. The state board of health, acting on the hypothesis that Beiling was abetting the Kay Jewelry Company to practice optometry, after notice and hearing, ordered his license to practice optometry revoked, and the governor of the state affirmed the board's action. Beiling then brought an action in the circuit court, Jefferson County, chancery branch, first division, to enjoin the board of health and its members from revoking his license. From an order of the trial court granting him the relief he asked, the defendants appealed to the Court of Appeals of Kentucky.

The order of the circuit court enjoining the revocation of Beiling's license was based on the express reasoning of the court that the purpose of the optometry practice act was to protect the public from unskilled persons examining and prescribing for eyes, that that purpose was met when the person so practicing had been licensed, and that as the Kay Jewelry Company acted only through its agent, Beiling, and did nothing which could be deemed to be the practice of optometry other than what Beiling did, it followed that the Kay Jewelry Company did not practice optometry and that consequently when Beiling, acting individually, collaborated with himself acting as its agent, he was not aiding or abetting the jewelry company to practice optometry. With this reasoning and conclusion the Court of Appeals disagreed. While a corporation, said the court, is a person for many purposes, it cannot be licensed to practice a learned profession, which can only be done by an individual who has received a license to do so after proving his qualification and knowledge of the subject. Thus, there is scarcely any judicial dissent from the proposition that a corporation cannot lawfully engage in the practice of law, medicine, dentistry or any of the limited healing arts. 41 Am. Jur., Physicians and Surgeons, Sec. 20. It seems that the less the personal equation enters into the particular practice, or the farther the service of the practitioner is removed from a personal relationship of trust and confidence and from the exercise of individual ability and talent, the more liberal becomes the judicial view as to the power of a corporation, or other entity not capable of being licensed itself, to carry on a profession or business through licensed individual employees. In the matter of the practice of optometry, the courts of the several jurisdictions are divided. Notes 141 A. L. R. 888. It will be found that most of the cases which hold in effect that an employer does not practice optometry through an employed licensed optometrist are distinguishable from those which hold to the contrary by differences in the terms of the statutes involved, which differences may relate to specific or implicit provisions, and in the particular facts. 41 Am. Jur., Physicians and Surgeons, Sec. 28. In some of the cases the character of the relationship between the corporation and the practitioner was controlling. Thus it is held that where only the relation of landlord and tenant exists, as where a licensed optometrist has his office in a store

and the proprietor advertises that such a practitioner is available to its customers, the relation is legitimate. *Rowe v. Burts, Inc.*, Ohio App., 31 N. E. (2d) 725. But it may be unlawful with additional or different conditions. *State v. Goldman Jewelry Co.*, 142 Kan. 881, 51 P. (2d) 995, *Neill v. Gimbel Bros.*, 330 Pa. 213, 199 A. 178. In the case at bar the court thought it particularly significant to consider the language of the Kentucky statute defining the practice of optometry, which read as follows:

"(a) 'Practice of optometry' means the examination of the human eye without the use of drugs, medicines or surgery to ascertain the presence of defects or abnormal conditions that can be corrected by the use of lenses, prisms or ocular exercises and their adaptation for the aid thereof and the correction or attempt to correct defects of the eye by any means, except upon the prescription of a physician.

"(b) Opening an office, or announcing to the public a readiness to do any of the acts mentioned in this subsection constitutes practicing optometry.

"(c) The practice of optometry does not include the sale of spectacles, eyeglasses or lenses only as merchandise in a duly established mercantile establishment." (KRS 311.010).

In this case, the court continued, the corporation did more than sell eyeglasses and lenses as merchandise. Its acts here clearly came within the purview of the statute just quoted in view of the specific provision of the statute declaring that the opening of an office and announcing a readiness to render the services of an optometrist constitutes practicing optometry. We are of the opinion, therefore, that the corporation was engaged in the practice of optometry within the meaning of the statute.

We cannot accept, the court continued, the premise of the argument or agree with the reasoning of the trial court that the corporation did nothing which can be regarded as practicing optometry other than what its employee did or that he was only acting as an individual in collaboration with himself as an agent. Surely the doctrine of respondeat superior would have applied had he committed a tort in and during the course of his employment. Optometry was one of the corporation's departments of business, and Beiling was its agent. His services are clearly within the meaning of aiding and abetting it in carrying on that business of which his professional services were only a necessary part. The essential element of aiding and abetting the commission of any act is assisting and taking an active part in it. Certainly, Beiling did that in the unlawful practice by his employer. We are of the opinion, therefore, continued the court, that the lower court should have refused to set aside the order of revocation of the state board of health. For the reasons stated the order of the state board of health, in effect, revoking Beiling's license to practice optometry was affirmed.—*Kendall v. Beiling*, 175 S. W. (2d) 489 (Ky., 1943).

Society Proceedings

COMING MEETINGS

- Alabama, Medical Association of the State of, Montgomery, April 18-20. Dr. D. L. Cannon, 519 Dexter Avenue, Montgomery, Secretary.
- Arizona State Medical Association, Phoenix, April 14-15. Dr. Frank J. Milloy, 112 N. Central Ave., Phoenix, Secretary.
- Arkansas Medical Society, Little Rock, April 17-18. Dr. W. R. Brooksher, 602 Garrison Avenue, Fort Smith, Secretary.
- Association of State and Territorial Health Officers, Washington, D. C., March 20-23. Dr. G. C. Ruhland, 300 Indiana Ave., N.W., Washington, D. C., Secretary.
- Conference of State and Provincial Health Authorities of North America, Washington, D. C., March 22. Dr. A. J. Chesley, State Office Building, St. Paul, Minn., Secretary.
- Florida Medical Association, St. Petersburg, April 13-14. Dr. Shaler Richardson, 111 West Adams St., Jacksonville, Secretary.
- Iowa State Medical Society, Des Moines, April 21-22. Dr. Robert L. Parker, 3510 Sixth Avenue, Des Moines, Secretary.
- Maryland, Medical and Chirurgical Faculty of, Baltimore, April 25-26. Dr. W. Houston Toulson, 1211 Cathedral St., Baltimore, Secretary.
- Minnesota State Medical Association, Rochester, April 13-15. Dr. B. B. Souster, 493 Lowry Medical Arts Bldg., St. Paul, Secretary.
- Missouri State Medical Association, Kansas City, April 23-25. Mr. Raymond McIntyre, 634 N. Grand Blvd., St. Louis, Executive Secretary.
- New Jersey, Medical Society of, Atlantic City, April 25-27. Dr. Alfred Stahl, 55 Lincoln Park, Newark, Secretary.
- New Orleans Postgraduate Medical Assembly, New Orleans, March 6-9. Dr. Joseph S. D'Antoni, 1430 Tulane Ave., New Orleans 13, Secretary.
- Northern Tri-State Medical Association, Toledo, Ohio, April 11. Dr. Oscar P. Klotz, 127 W. Hardin St., Findlay, Ohio, Secretary.
- Oklahoma State Medical Association, Tulsa, April 24-26. Dr. L. J. Moorman, 1200 N. Walker St., Oklahoma City, Secretary.
- Tennessee State Medical Association, Nashville, April 11-13. Dr. H. H. Shoulders, 706 Church St., Nashville, Secretary.

